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Concurrent Teacher and Leadership Professional Development in Algebra I: Shared Instructional Leadership and Instructional Program Cohesion

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Concurrent Teacher and Leadership Professional Development in Algebra I: Shared Instructional Leadership and Instructional Program Cohesion

by

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Dedication

This dissertation is dedicated to my family and friends.

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Concurrent Teacher and Leadership Professional Development in Algebra I: Shared Instructional Leadership and Instructional Program Cohesion

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Over the years, significant curricula reform and professional development efforts designed to improve teachers' abilities to implement standards-based mathematics curriculum and instruction have been enacted, with Algebra I teachers receiving significant attention. These mathematics professional development efforts, however, have largely ignored the central role of the school principal and school instructional leaders in mathematics education improvement.

This study utilized a multiple case study format to examine the potential usefulness and benefits of professional development where both the high school principal and Algebra I teachers were concurrently engaged in coordinated professional development activities. The primary purpose of this qualitative study was to examine the perceptions of high school principals and lead Algebra I teachers to determine which aspects of concurrent professional development they perceive as critical to their work in the areas of curriculum, instruction, and assessment. This study provides a

descriptive account of participant perceptions of concurrent professional development components and the importance of the professional development components.

Two themes emerged from the interviews. Participants viewed the concurrent professional development as assisting them in attaining the following: (1) the development of a shared vision for the Algebra I program and (2) the emergence of instructional program coherence. Furthermore, within the context of the concurrent professional development setting data revealed that: (1) instructional leadership exists as a shared function, (2) instructional leadership actions stemmed from the tools produced within the concurrent professional development, and (3) shared instructional leadership created the emergence of Algebra I program coherence.

The results of this study indicate that participants found value in the components of concurrent professional development that united instructional leadership tasks and instructional program coherence indicators. Results of the study suggest that concurrent professional development activities incorporating instructional leadership tasks and instructional program coherence indicators can serve both principals and lead teachers to improve their Algebra I program.

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CHAPTER 1: Problem Statement

INTRODUCTION

Since the mid-1980s there has been a focused, ongoing attempt to change mathematics education in the United States. For more than two decades, the National Council of Teachers of Mathematics (NCTM) has painted a vision of what the mathematics classroom should look like. NCTM documents such as *An Agenda for Action: Recommendations for School Mathematics of the 1980s* (National Council of Teachers of Mathematics, 1980), *Curriculum and Evaluation Standards for School Mathematics* (1989), *Professional Standards for Teaching Mathematics* (1991), and most recently *Principles and Standards for School Mathematics* (2000) describe recommended shifts in the teaching and learning of mathematics. More recently, expectations have changed at the national, state, and local levels with new emphases on standards, high-stakes testing, and accountability. The significance of this trend is evident in recent national legislation, in particular the *No Child Left Behind Act*.

Over the years, significant efforts such as those funded by the National Science Foundation, (i.e., Local Systemic Change Initiatives, State Systemic Initiatives, reform curricula, and professional development initiatives), designed to improve teachers' abilities to implement standards-based mathematics curriculum and instruction have been enacted, with Algebra I teachers receiving significant attention. The professional development emerging from these efforts has historically targeted teachers as the recipients of reform efforts. The educational literature is filled with examples of mathematics professional development work with teachers (Aichele, 1994; Ball, 1996;

Darling-Hammond & Sykes, 1999; Desimone, Porter, Garet, Yoon, & Birman, 2002; Loucks-Horsley, Love, Stiles, Mundry, & Hewson, 2003; Mokros, Russell, & Economopoulos, 1995), but is sparse where principals are concerned. Since the mid-1990s business and foundation advocates for educational improvement have funded professional development programs for principals. The development of such principal professional development programs is a response to educational policymakers' belief that professional development of principals is a powerful way to gain optimum student achievement and influence teacher actions (Corcoran, McVay, & Riordan, 2003; Hallinger & Murphy, 1987). Rare, however, are examples where teachers and principals are engaged in concurrent professional development.

While teacher professional development typically focuses on content and pedagogy, administrator professional development is typically aimed at compliance, management, regulations, and building maintenance issues. However, since the mid-1990s most administrative leadership programs have added generic, content-independent instructional leadership components. Still, leadership researchers agree that the professional development efforts targeting principals have done little to respond to the call for principals to become instructional leaders of mathematics reform (Bloomberg & Greenfield, 1980; Bossert, Dwyer, Rowan, & Lee, 1982; DuFour, 1995; Glickman, Gordon, & Ross-Gordon, 2001; Jamentz, 2002; Leithwood, 1995), while the mathematics professional development efforts have largely ignored the central role of the school principal and school instructional leaders in school improvement efforts.

PROBLEM STATEMENT

Rising expectations, the mathematics standards movement, and state and federal assessments and accountability systems have established new measures by which schools are being held accountable. Meeting these new mandates requires changing roles for those who work in schools. The most notable change, perhaps, can be found in the role of the high school principal, as high school principals are increasingly called upon to be leaders of curricular change and innovative instructional strategies. A high school principal has to be not only an effective manager, but also the leader of an instructional team. High school principals are being asked to support a new approach to teaching and learning that they know little about. Researchers agree that a key factor in the successful implementation of Algebra I is the presence of a strong instructional leader (Cohen, Raudenbush, & Loewenberg Ball, 2000; Elmore, 2002a; Little, 1993; St. John et al., 1999; Yañez & Wenrick, 2000). In most cases this is the principal. The influence of the principal cannot be ignored, as illustrated in a study conducted by Hallinger and Heck (Hallinger & Heck, 1996), who asked teachers what made them most likely to adopt an innovation. The most frequently mentioned reason was "administrative pressure." Simply put, administrative expectations and pressures can affect teacher behaviors and implementation of innovations. This presents a challenge for mathematics and Algebra I, in particular, because principals who are effective instructional leaders at the high school level are distinctly in the minority (Fullan, 1990).

There exists extensive research and literature indicating that the professional development of teachers is a key ingredient in improving our schools (Corcoran et al., 2003; Darling-Hammond & Sykes, 1999; Drago-Severson, 2002; Elmore, 2002b;

Lieberman, 1988; Little, 1993; Sparks, 2002). Similarly, much has been written suggesting that transforming principals into instructional leaders via professional development is key to improving our schools. Typically, however, principal and teacher professional development activities have been conducted independently of one another. Thus, there exists a need to study the potential of concurrent teacher and principal professional development.

THE PARTNERSHIP FOR HIGH ACHIEVEMENT

The Charles A. Dana Center is an organized research unit of the College of Natural Sciences at The University of Texas at Austin. The Dana Center supports education leaders and teachers in strengthening Texas education through a variety of professional development and outreach projects. The Charles A. Dana Center's Partnership for High Achievement synthesizes what has been learned about systemic school and district improvement from researchers such as Dufour (1998), Elmore (2002a), Johnson (J. Johnson, Skrla, & Scheurich, 2000), Marzano (2003), and Smoker (2001). The Partnership for High Achievement is a higher education-district partnership that involves more than 60 Texas districts and schools that desire to strengthen student learning in mathematics and/or science. The Partnership for High Achievement works to support these efforts on a variety of levels from the district level to the classroom level. A cornerstone of the Partnership for High Achievement is its integration of strategies designed to build simultaneously district and campus leadership capacity with proven methods of building teacher capacity. Comprehensive research- and evidence-based professional development activities for both leaders and

teachers have been developed and implemented in a concurrent manner so that both teachers and leaders are simultaneously engaged in professional development activities.

At the heart of the Partnership work is the concurrent, overlapping professional development and technical assistance provided to leaders and teachers alike. Both the leadership and teacher professional development focus on aligning the written, tested, and taught curriculum with an emphasis on teaching teachers and leaders to use and support a structured, professional, collaborative process for planning, implementing, and reflecting upon instruction and student learning.

PURPOSE OF THE STUDY

The purpose of this study was to examine the perceptions of high school principals and Algebra I teachers to determine which aspects of concurrent teacher and principal professional development they perceive as critical to their work in curriculum, instruction, and assessment. One desired outcome of this study was greater understanding and clarity of the impact of integrated teacher and leader professional development. This study was designed to examine the potential usefulness and benefits to principals and teachers of concurrent professional development.

RESEARCH QUESTIONS

This study examined the perceptions of high school principals and Algebra I teachers to determine which aspects of concurrent teacher and principal professional development they perceive as critical to their work. The following research questions were explored in this study:

1. What components of concurrent professional development did teachers and principals perceive as important to them in improving Algebra I curriculum, instruction, and assessment?
2. In what ways were these components perceived important?

This research utilized case studies of five Texas school districts involved in an Algebra I improvement initiative where both the principals and their Algebra I teachers were engaged in concurrent professional development. This sampling contained ten high schools. Reputational sampling was utilized to ensure the condition of the research question such that principals and Algebra I teachers participated in concurrent professional development.

LIMITATIONS

As with all case study research, the primary limitation of this study was its small sample size, making it difficult to generalize findings to a larger population. Additionally, this sample population is highly contextualized due to the uniqueness of

the Algebra I improvement initiative in which the participants were involved, making it difficult to replicate the environment in which the study is situated. Furthermore, this study is situated in a high-stakes accountability environment containing significant sanctions for poor student performance. The pressure to achieve in high-stakes environments may compel educators to act in ways they may not otherwise—in both positive and negative ways.

SUMMARY

In their search for ways to improve school performance, educators and policymakers have addressed a broad array of challenges confronting schools. These approaches to improvement have included raising standards, refocusing school goals on student achievement, and strengthening teacher professional development. Too often, though, professional development activities focus on just one of the stakeholders of a school or district and ignore the essential role that others in the system play in the success of mathematics reform. For example, professional development activities are often targeted at teachers, as if teachers work in isolation (Chapin, 1996). This is in contrast to the findings suggesting that a key factor in the successful implementation of mathematics improvement efforts includes the presence of a skilled principal (Cohen et al., 2000; Elmore, 2002a; Little, 1993; St. John et al., 1999). Principals, then, play a key role in shaping the environment in which teachers and students succeed or fail.

There is no shortage of approaches to teacher or principal professional development. Despite the interdependent nature of the principal-teacher relationship,

principal and teacher professional development activities are conducted primarily independently of one another. Improving this independent teacher and principal professional development has yielded limited success in improving the teaching of Algebra I. It appears, then, that professional development aimed at simultaneously improving both teachers' and leaders' knowledge and skills may hold promise and should be explored.

CHAPTER 2: Literature Review

CONCEPTUAL FRAMEWORK

Researchers and practitioners have long recognized that school reform and staff development are integrally related (Ball, 1996; Clarke, 1994). However, neither teacher professional development nor policy mandates alone have produced wide-scale results (Cohen et al., 2000; Porter, Smithson, & Osthoff, 1994). Although much has been written about what constitutes useful, effective professional development for mathematics teachers (Acquarelli & Mumme, 1996; Ball, 1996; Loucks-Horsley et al., 2003; Sparks, 2002), little exists regarding effective professional development for principals in the area of mathematics instruction. This is the case despite the voluminous body of effective schools research specifying that the presence of a skilled principal who acts as an "instructional leader" is one of the most important ingredients of a school that works (Andrews, Basom, & Bason, 1991; Blase & Blase, 1999; Cohen, 1995; DuFour, 2002; Elmore, 2002a; Hallinger & Heck, 1996). It follows then that a study exploring the potential of professional development activities aimed at simultaneously working to improve the knowledge and skills of both Algebra I teachers and principals is vital. Four literatures inform this study: Algebra I mandates literature, instructional leadership literature, principal training/professional development literature, and teacher professional development literature.

ORIGINS OF ALGEBRA I MANDATE

Since the publication of *An Agenda for Action* and *Nation at Risk* in the early 1980s, school reform has been a top priority for policymakers and practioners alike (Lagemann & Shulman, 1999). While diverse in nature, many of these reform efforts targeted the teaching and learning of mathematics. These efforts not only sought to improve mathematics achievement, but to ensure that all students were exposed to and would succeed in higher-level mathematics courses.

Influences of these improvement efforts and others more recently can be seen at the national, state, and local levels with new emphases on standards, high-stakes testing, and accountability. The significance of these new emphases is evident in recent national legislation and funding acts, such as *No Child Left Behind Act*.

The National Council of Teachers of Mathematics (NCTM), a front runner in the reform efforts, painted a vision of what the mathematics classroom should look like in order to improve student learning. The reform efforts of the 1980s and 1990s, *An Agenda for Action* (1980), *A Nation at Risk* (1983), *Mathematics Equals Opportunity* (1997) and the collection of NCTM Standards documents not only support a change in the vision of what the mathematics classroom should look and sound like, but also support the position that all students should take more advanced courses in mathematics. This more inclusive and rigorous perspective advocates Algebra I as a minimal graduation requirement, referring to Algebra I as "the gateway" to rigorous mathematics courses. The primary objectives of this more inclusive algebra vision are to:

- engage students in higher-level thinking,
- encourage the use of language and symbols of mathematics;

and

- develop a deep understanding of mathematical concepts.

Many states, districts, and campuses adopted the notion of mandating Algebra I, most with little success in changing what and how mathematics was taught and learned (Cohen et al., 2000; Elmore, 2002a).

Limited Success of Algebra I Mandates

There is no doubt that standards have begun to influence the education system. Many states and districts have implemented Algebra I mandates in an attempt to improve student achievement. Researchers (Cohen et al., 2000; Elmore, 2002a; Porter et al., 1994; Silver, 1995) have explored the efficacy of Algebra I mandates in various states, and their findings are remarkably consistent. Porter and colleagues (1994) found mandating Algebra I alone did little to change teachers' instructional practices. Constructivist activities called for by the standards reform efforts whereby students are engaged actively in doing mathematics and in constructing schemas of concepts did not occur. "For virtually all of the course types studied, students spent the majority of their time either being talked to by the teacher or working independently at their desks" (Porter et al., 1994).

Silver's (1995) study of the College Board's Equity 2000 project found that the amount of support for schools and teachers varied and, in many cases, teachers did not experience opportunities to interact with their colleagues on strategies to implement the mandate. In those cases where administrators did not support time for teacher interaction, teachers further isolated themselves within their classrooms (Cohen et al.,

2000). This isolation undermined the group decision-making process found to be necessary for successful adoption of the Algebra I mandate (Silver, 1995). Simply mandating Algebra I alone does little to cause teachers to embrace and implement the ways of teaching and learning advocated by NCTM.

Algebra I Mandate in Texas

The influence of standards can be observed in the ways they have begun to shape the education system. Many states, including Texas, incorporated NCTM's recommendations into their state standards and graduation requirements. The Texas curriculum standards, the Texas Essential Knowledge and Skills (TEKS), identify what student should know and be able to do in the Algebra I course. The Texas curriculum standards, reflect the vision outlined in the NCTM documents while maintaining rigorous standards for algebraic content.

With the passage of HB 103 in the Seventy-fifth Legislative session, the Texas Legislature raised the bar in terms of students' graduation requirements. Courses below Algebra I do not meet the graduation requirements. Aligned with the Algebra I curriculum standards, a new graduation assessment now requires students to demonstrate understanding of the Algebra I and Geometry standards (Patterson, 2002). Additionally, since 1997, Texas graduation requirements have included three mathematics credits, two of which must be Algebra I and Geometry. Thus, for all Texas students, Algebra I is the beginning high school-level mathematics course. This legislative action has thrust Algebra I student achievement into center stage.

Algebra I Student Performance

In response to this policy decision, many districts, schools, administrators, and teachers created transition efforts to promote student success in Algebra I. Despite these efforts, gains in the state-mandated Algebra I End Of Course exam scores for some student sub populations have remained low (www.tea.state.tx.us/student.assessment). Table 2.1 shows statewide Algebra End of Course disaggregated passing rates for 1996 through 2002.

Table 2.1: Algebra End of Course Passing Rates 1996–2002

Year	All Students	African American	Hispanic	White	Economically Disadvantaged	Limited English Proficient
1996	27%	10%	13%	38%	13%	8%
1997	33%	14%	19%	46%	19%	9%
1998	38%	19%	25%	50%	24%	14%
1999	45%	25%	32%	58%	31%	19%
2000	45%	27%	34%	57%	32%	19%
2001	51%	32%	39%	64%	37%	20%
2002	60%	44%	49%	72%	47%	29%

Although most student sub populations have experienced average gains of more than 30%, only the white students have passing rates of more than 50%. This discrepancy in student performance is somewhat disappointing, given the considerable state and local resources that have been allocated to the effort to improve Algebra I End Of Course exam performance. On the other hand, one could argue that the gains in the Algebra I End Of Course student performance are remarkable, especially given the following: (1) a dramatic increase in student enrollment in the Algebra I course, (2) the exam is moderately difficult, and (3) the scores were not part of the Texas accountability system.

Change in Texas's Assessment

Adequate algebra performance, or lack there of, is receiving increased attention across the state of Texas due, in part, to the new, more rigorous student assessment system. Although Algebra I End Of Course student performance was not previously included in the Texas accountability system, the content of this assessment will be included on Texas's more rigorous assessment, the Texas Assessment of Knowledge and Skills (TAKS). The content of the ninth, tenth, and eleventh grade TAKS is in sharp contrast to its predecessor, Texas Assessment of Academic Skills (TAAS). The high school level TAAS contained mathematics content aligned to eighth grade content, rather than to the content of the high school mathematics courses, such as Algebra I and Geometry. As of Spring 2003 the TAKS contains significant amounts of Algebra I content similar to that found on the Algebra I End of Course.

Not only do the ninth, tenth, and eleventh grade mathematics TAKS contain significant amounts of Algebra I, obtaining a passing score on the eleventh grade assessment is required for high school graduation. While Algebra I has received some attention in the past few years, the inclusion of Algebra I content on TAKS has thrust Algebra I into the spotlight. Clearly, Algebra I is more important than ever.

Algebra I Mandates: What is necessary?

Improving Algebra I End-of-Course Exam Scores: Evidence from the Field (Yañez & Wenrick, 2000) explored the efficacy of Texas's Algebra I mandate by examining Texas secondary schools with improving Algebra I End of Course scores. In this study, Yañez and Wenrick utilized a matched-pair methodology comparing secondary schools with improving Algebra I End of Course scores to those with declining Algebra I End of Course scores. The study aimed to "capture and describe instructional strategies and policy decisions that have proved critical at schools that have seen improved passing rates on the Algebra I End of Course" (p. 11). Six critical issues believed to influence student achievement were explored. These issues and specific findings are detailed below:

(1) <u>A sense of urgency about improving algebra instruction</u>

Findings: Teachers from schools with improving scores did "whatever it takes." This sense of urgency was shared by the whole school community and was reflected in their actions. In contrast, teachers from schools with declining scores did not share a sense of urgency with all stakeholders and other assessments took priority.

(2) An "Algebra for All" vision

Findings: Despite concerns voiced about students lacking basic skills, teachers at schools with improving scores indicated that they could help all of their students to understand algebra. These teachers maintained high expectations and provided multiple opportunities for all students to succeed. In comparison, teachers from schools with declining scores suggested that not all students were ready for algebra and thought that students should take less difficult mathematics classes.

(3) Teamwork and collaboration

Findings: Teachers from schools with both increasing and decreasing scores reported working together and collaborating with colleagues. However, the teachers from schools with increasing scores reported that teamwork and collaboration were frequent, planned, supported, and structured with purpose. Although teachers from schools with declining scores reported working together, their collaboration was infrequent and lacked support and structure.

(4) Professional development

Findings: Professional development was viewed as a tool for promoting quality instruction and teacher collaboration/teamwork in schools with improving scores. These schools reported that all or most teachers participated in similar, targeted professional development as a team. In contrast, schools with

declining scores reported professional development to be essentially nonexistent.

(5) Textbook selection and use of supplemental resources

Findings: Teachers from both groups reported using state-adopted textbooks. No evidence was found that any single textbook was more or less effective than any other at helping students learn algebra. However, teachers at the schools with improving scores tended to use their textbook as a tool rather than relying exclusively on the textbook to cover concepts.

(6) Class schedules and time in the classroom

Findings: No particular schedule structure could be linked to improving or declining scores. However, teachers from schools with increasing scores reported using a variety of instructional strategies and resources. In comparison, teachers from schools with declining scores did not report using a variety of instructional strategies or resources. Rather, they used class time to have students complete homework.

Possibly the most significant Yañez and Wenrick finding was that a key factor in the success of these campuses included the presence of a skilled principal who (1) creates a sense of shared urgency around improving the teaching and learning of Algebra I, (2) provides resources that support collaboration among mathematics teachers, (3) provides classroom resources, and (4) provides planned, content-based teacher professional development.

In short, the actions taken by administrators and teachers together in schools with improving scores on the Algebra I End of Course were considerably different from those taken by administrators and teachers in schools with declining scores. Specifically, administrators in schools with improving scores established Algebra I performance standards, assigned experienced teachers to teach Algebra I, provided materials and resources, supported on-going teacher professional development, and strengthened the classroom environment. It was the actions taken by the campus principal that had a bearing on improving student performance in Algebra I.

Researchers (Cohen et al., 2000; Elmore, 2002a; Little, 1993; St. John et al., 1999) support Yañez's finding that key factors in the successful implementation of Algebra I included the presence of a skilled principal. Principals, then, are critical to the success of efforts to improve the Algebra I program. Principals set the tone, provide support and resources, and create shared expectations that shape the Algebra I program. Clearly, the principal plays a pivotal role in improving student achievement in Algebra I. Research on implementation of improvement efforts strongly suggests that the processes of principal interaction, sustained interaction and staff development are crucial to improved Algebra I performance.

THE PRINCIPALSHIP

The school principalship has been the subject of hundreds of studies over the past 35 years (Barth, 1990; Bottoms & O'Neill, 2001; Drago-Severson, 2004; DuFour, 2002; Elmore, 2002c; Hallinger & Heck, 1996; Leithwood & Jantzi, 2000; Sergiovanni, 1987, 1992; Smith & Andrews, 1989). The central role of the principal

has been viewed, variously, as building manager, administrator, politician, change agent, and instructional leader. When the school reform movement began in the 1980s, the first consequence for school leaders was pressure to put student learning at the center of their jobs. It is well established that strong leadership is critical for successful school reform (Bryk & Schneider, 2002; Datnow & Castellano, 2001; Lashway, 2002; Murphy, 1990). Taken collectively, the "effective schools" studies reflect the view that the direct responsibility for improving instruction and learning rests in the hands of the school principal.

The Principal as Essential Ingredient

Educational administration literature resonates one united message: leadership is essential to substantive and enduring progress (Smoker, 1999). As standards-based school reform nears its twenty-fifth anniversary, policymakers and researchers continue to assert the need for strong principal leadership–with good reason. Virtually every state, as well as the federal government, puts accountability for results directly at the school level.

A number of researchers and practioners (Barth, 1981; Blase & Blase, 1999; DuFour, 2002; Glickman, Gordon, & Ross-Gordon, 1998; Hallinger & Heck, 1996; Murphy, 1990; Sweeney, 1982) have explored the behaviors of principals. In order to better understand the principals' behavior Sweeney (1982) analyzed eight research projects on effective school leadership and found "the direct responsibility for improving instruction and learning rests in the hands of the school principal" (p. 346). He further surmised that principals of schools with high achievement demonstrate

particular leadership behaviors. Of the eight studies Sweeney reviewed, all eight found that effectiveness is enhanced by principals who emphasize achievement; all eight found principals who set instructional strategies to be of primary importance; seven of the studies found an orderly environment to be significant; five found frequent monitoring of student success to be of value; four studies found coordination of instruction to be important; and three studies found support for teachers to be important. In summary, these results indicate that principals in effective schools coordinate curriculum and instructional matters, monitor student progress, and provide support for teachers. The principal, then, plays an essential role in any improvement effort. The role of the principal must be considered in the planning and development of improvement initiatives.

The principal is a key figure in determining the ultimate success of any effort to develop school personnel, and thus plays a major role in school improvement resulting in more effective schools. Studies of the school improvement process reinforce the critical role of the principal in that process, concluding that the necessary conditions for improvement are motivated by the principal (Bennis & Nanus, 1985; Boyer, 1998; Hallinger & Heck, 1996; Hallinger & Murphy, 1987; Sergiovanni, 1992). Although most of the effective schools research has been conducted at the elementary level, Boyer (1983) conducted a study of selected high schools. His findings were consistent with the effective elementary schools research: leadership matters. This finding is significant for secondary campuses, as instructional improvement efforts are often decentralized and are considered the domain of the respective department.

These findings extend beyond the school as an organization but can be applied to the programs and initiatives within the school itself. In a study of hundreds of innovative educational programs the conclusions were the same—one of the major factors affecting the ultimate success of the program was the involvement and support of the principal (Berman and McLaughlin, 1978). Conversely, Goodlad (1984) and others argued that the primary reason most schools were unable to solve school-wide problems is that the principal lacked the prerequisite skills of group leadership.

Leadership, therefore, determines the ultimate success or failure of any improvement effort, including mathematics reform and teacher professional development efforts. These findings have significant implications for professional developers working in schools and underscore the importance of involving principals and planning for the development of their knowledge and skills.

Principal as Instructional Leader

There is little disagreement concerning the belief that principals play a critical role in the lives of teachers, students, and schools. This belief has led to considerable research into the nature of principals' work, attitudes, values, thought processes, and behavior that support improved student achievement.

As previously established, leaders hold potential in helping schools improve student achievement. In his vision for improving schools, Barth (1990) declared, "Show me a good school, and I'll show you a good principal" (p. 64). A considerable body of effective schools research (Andrews et al., 1991; Blase & Blase, 1999; Cohen, 1995; DuFour, 2002; Elmore, 2002a; Hallinger & Heck, 1996) describes the principal

as “instructional leader” as one of the most important ingredients of a school that works. Such a principal:

- keeps the school’s focus on instruction,
- sets a constructive tone and high expectations,
- works to ensure a common curriculum; and
- provides resources for teachers.

Instructional leadership has as its core the intention to improve teaching and learning and necessitates focused interaction between principal and teacher. Instructional leadership requires the administrator to be involved with issues of curriculum and instruction practices. Not only must school leaders perform what Richard Elmore (Elmore, 2002a) calls “the ritualistic tasks of organizing, budgeting, managing, and dealing with disruptions inside and outside the system” (p. 5), but today’s instructional leaders must be able to develop the teachers in their schools. Leadership, therefore, must be knowledgeable in curriculum, instruction, and assessment in order to support improvement efforts (Wright, 1991).

Numerous researchers have studied instructional leadership, generating various definitions of the concept. For example, Keefe and Jenkins (1984) describe instructional leadership as “the principal’s role in providing direction, resources, and support to teachers and students for the improvement of teaching and learning in the school” (p. 7). This parallels Niece’s (1993) definition of instructional leadership as a principal possessing a substantial knowledge base in curriculum, instruction, and evaluation; providing vision and direction for the school; promoting positive teaching and learning environments; establishing patterns of effective communication and motivation; and maintaining high expectations for self, staff, and students. Similarly,

Wilma F. Smith and Richard L. Andrews (1989) offer a definition of instructional leadership where by the principal acts as (1) resource provider, (2) instructional resource, (3) communicator, and (4) visible presence. Despite the researchers' differing descriptions—all of which are legitimate and accurate in capturing the essence of instructional leadership—the underlying construct is the same. Instructional leadership focuses on the importance of principals giving prime attention to the schools' core functions—teaching and learning.

Eberts and Stone (1998) further the instructional leadership literature by examining specific actions taken by an instructional leader. They identified the following variables that reflect principals' instructional leadership actions (1) the time principals spend in curriculum development, (2) the degree to which teachers believe their school has a coordinated curriculum, (3) the time principals spend in program planning and evaluation, (4) the frequency with which the principal engages in classroom observations, (5) the degree to which teachers believe that the principal is supportive of them, and (6) the degree to which teachers perceive the principal to be an innovative instructional leader (p. 293). These actions exemplify the instructional leader's focus on matters of curriculum and instruction as well as teacher support. Additionally, the findings suggest that one cannot be an effective instructional leader if one does not possess adequate knowledge and skills in the area of curriculum and instruction.

Despite the varying definitions and characteristics of instructional leaders found in the literature, there is much agreement regarding the overarching ideas encompassed. There is, for example, considerable concurrence that effective principals who are good instructional leaders spend large amounts of time in classrooms,

observing teaching and encouraging higher performance. They track student test score results and other indicators of student learning to assist teachers in focusing attention where it is most needed. Equally important, instructional leaders focus much of their time on staff development, helping teachers assist all students in reaching high standards. Instructional leaders challenge staff members to examine traditional assumptions about teaching and provide opportunities for them to share information and to work together to plan curriculum and instruction (Blase & Blase, 1999; Hallinger & Heck, 1996; Smith & Andrews, 1989).

Standards-based accountability challenges traditional assumptions about the principalship. Nevertheless, there is general agreement that instructional leadership is a critical skill. This means that school leaders must have in-depth knowledge of curriculum and instruction. This, in turn, raises questions regarding what exactly school leaders need to understand about curriculum and instruction. Bottoms (2001) and other researchers agree that the school leader should:

(1) understand the "big ideas" that should be taught in the core curriculum. They do not need to be experts, but they should know enough to determine whether students are being taught the body of knowledge they are expected to learn.

(2) know enough about state and national standards to help teachers identify the most important standards

(3) know how to distinguish between "regular" and "advanced" courses, such as the differences between a regular language arts course and an honors language arts course

(4) know what students are supposed to learn and the standards they are supposed to meet in order to determine whether instruction and assessment activities are appropriate

(5) have a working knowledge of effective instructional strategies and be able to recognize whether or not they are being used effectively

Today, instructional leadership remains a dominate theme, but it is taking a much more sophisticated form. Initially, administrators qualified as instructional leaders by paying attention to instruction: setting curricular goals, monitoring lesson plans, and evaluating teachers. Today, instructional leaders immerse themselves in the "core technology" of teaching and learning, use data to make decisions, and align staff development with student learning needs (Lashway, 2002). They must perform the following key instructional leadership tasks: provide vision and direction for the instructional program; set a constructive tone and high expectations; work to ensure a common curriculum framework; establish clear expectations for implementation of the common curriculum framework; and monitor and holding staff accountable for the effective implementation of the common curriculum framework. Few principals, however, have in-depth knowledge and skills in curriculum and instruction necessary to effectively carry out the role of instructional leader. This is especially true in today's standards-based environment (Bottoms & O'Neill, 2001; Sparks, 2004).

PROFESSIONAL DEVELOPMENT

Glickman (2001) defined professional development as the continuous education of educators for the purpose of improving the quality of education in a school. Successful innovation, then, presupposes and requires that educators develop themselves professionally (Darling-Hammond & Sykes, 1999; Fullan, 1991; Glatthorn, 2000; Lee, 1991; Sergiovanni, 1987; Sparks, 2002). DuFour (1995) states ". . . school improvement means people improvement. It is self-evident that the quality of personnel is of central importance to a school, and that enabling individuals to improve their effectiveness is the key to any meaningful school improvement effort" (p. 7).

Need for Principal Professional Development

In the 1970s and 1980s, schools were simpler organizations and little accountability for student achievement existed: their administration was not an arduous task. The administrator could learn his profession effectively on the job by trail-and-error processes. Little if any formal specialized preparation was needed (Murphy, 1990). Once the educational reform spotlight was directed to the preparation and skills of the school principal and the need for principals to function as instructional leaders, many insufficiencies surfaced, such as dysfunctional training and the absence of accountability (Murphy, 1990).

Facing new roles and heightened expectations, principals require new forms of preparation and training, especially in the areas of curriculum, instruction, and assessment matters (Bottoms & O'Neill, 2001; Sparks, 2004). Standards-based

accountability challenges traditional assumptions about the principalship. Nevertheless, despite general agreement that instructional leadership is a critical skill, few principals have in-depth training for that role, especially in a standards-based environment. School leaders need deeper knowledge of content fields and instructional methods in subject matter content (Bottoms & O'Neill, 2001).

Inadequate Principal Professional Development

Administrative training programs have been described in recent literature as being muti-faceted, but fragmented. From the university-based programs to district professional development, administrative seminars are limited and informal (Taylor, 1997; Wildy & Wallace, 1995). Personal readings and one-day training sessions with no lasting impact are common. Often lacking is a framework upon which to apply such learning. The results of such professional development are predictable: little effect on practice.

Although various professional development programs exist to improve educational leadership, the literature reveals a lack of programs that focus on improving instruction (Smoker, 1999). For example, most universities still require very little study in curriculum and instruction (Bottoms & O'Neill, 2001; Daresh, 2002; Neil & Carlisle, 2001; Niece, 1993). University programs overwhelmingly emphasize traditional school administration, with most attention focused on financial management, labor negotiations, school law and facilities planning (Sykes, 2000). This is paradoxical when confronted with the extensive research indicating that successful schools have principals as instructional leaders at the helm.

Principals' work is complex and affects all aspects of school success, particularly the instructional program (Blase & Blase, 1999; Hallinger & Heck, 1996). Despite recent reforms in improving the knowledge and skills of classroom teachers, principal training has been discounted (National Institute on Educational Governance, 1999). Discounting of principal professional development in a time of increased accountability is in conflict with Peterson (Peterson, 2002). He points out that with professional development, leaders can be more effective in the ways they learn in the workplace of a school environment.

With professional development, leaders can develop the knowledge and skills necessary to become effective instructional leaders (Peterson, 2002; Tsurda, 1998), thus enhancing the instructional program. Researchers agree that the need for career-long learning among school administrators can no longer take a back seat to skill development of other educational professionals such as teachers. Principal learning is elevated in importance, in part, by research stating that principals control the instructional program; therefore, they affect learning opportunities for teachers and students (Bossert et al., 1982; Lee, 1991; Sergiovanni, 1987). Principal training is, therefore, imperative for the continuance of instructional leadership, teacher growth, and student academic programs.

Schools cannot ensure teacher and student learning success without benefit of proper training (Bloomberg & Greenfield, 1980). Smith and Andrews (1989) found that teachers who regard their principals as strong instructional leaders invariably point to the principals' collaborative and active involvement in staff development activities as evidence of instructional leadership. Districts that make principal professional development a priority can assist him/her in doing the right things to

enhance the instructional program of the school. Research consistently supports the notion of collaboration as a key ingredient for improvement, in short, the actions taken by administrators and teachers together in schools produce significant student achievement results (Yañez & Wenrick, 2000). Therefore, principals who wish to fulfill the role of instructional leaders must recognize their responsibilities in the development of the staffs they are attempting to lead. A call for collaborative action among educators is needed to maximize the knowledge and skills of teachers and principals.

Effective Mathematics Teacher Professional Development

The reform of mathematics education rests firmly on a commitment to enhance the current practice of teaching and learning in our schools. The vision of mathematics and science teaching and learning is based on the standards developed by the National Council of Mathematics Teachers (NCTM). The NCTM standards and resulting mandates proved to be difficult to implement (Cohen et al., 2000; Elmore, 2002a). This difficulty in turn, has resulted in efforts that target improving teachers' abilities to implement standards-based curriculum and instruction, with most of these efforts utilizing teacher professional development as the key. There exists extensive research and literature (Elmore, 2002a; Guskey & Huberman, 1995; Little, 1993) indicating that the professional development of teachers is a vital ingredient in improving schools. In fact, there are few who debate the need for effective, ongoing professional development for teachers.

Many authors have surveyed research on professional development for mathematics teachers (Ball, 1996; Clarke, 1994; Darling-Hammond & Sykes, 1999; Guskey & Huberman, 1995; Loucks-Horsley, Hewson, Love, & Stiles, 1998). Educational literature in the last decade has built a convincing argument about the role of professional development in promoting teaching quality and increasing student achievement (Sykes, 1999). Simply put, the argument is this: What teachers know and do impacts what their students know and do. Deeper content knowledge, more content specific instructional strategies, and greater understanding about how students learn better enable teachers to craft instruction to meet the varying needs of students and to help them achieve rigorous content standards (Darling-Hammond & Sykes, 1999). Richard Elmore (Elmore, 1995) perhaps said it best: "If you're going to make the changes in student learning that accountability requires, you have to dramatically increase the skill and knowledge of teachers and principals." Although we know much about what constitutes "best practice," there is less guidance about how to design professional development so that it promotes continuous learning in the organization.

A consistent message throughout the NCTM standards is the importance of teachers' being reflective about their teaching and working with colleagues and supervisors to improve their teaching (Acquarelli & Mumme, 1996; Andrews et al., 1991; Clarke, 1994; Fullan, 2003; Scott Nelson & Sassi, 1998; Yañez & Wenrick, 2000). For teachers to be able to change their role and the nature of their classrooms, they need time to learn and develop new teaching practices (Darling-Hammond & Sykes, 1999). Researchers (Acquarelli & Mumme, 1996; Ball, 1996; Cohen et al., 2000; Darling-Hammond & Sykes, 1999; DuFour & Eaker, 1998; Loucks-Horsley et

al., 2003; St. John et al., 1999) concur that such improvement is more likely to occur when teachers have the support to engage in professional development.

Teacher professional development has long been a critical ingredient of the reforms called for by the NCTM standards (Cohen, 1995; Darling-Hammond & Sykes, 1999; Guskey & Huberman, 1995; Leinwand, 1992). During the last two decades, U.S. educators and policy makers have implemented a variety of programs aimed at increasing teachers' knowledge and skills. From both practice and research, we have learned much about what constitutes effective professional development (Guskey & Huberman, 1995; Loucks-Horsley et al., 1998). The professional development literature is filled with remarkably similar lists describing what constitutes effective professional development. Limited variance in these lists indicates a growing consensus as to what constitutes high-quality teacher professional development. The common themes include:

1. Focusing on deepening teachers' content and pedagogical skills
2. Providing opportunities for practice, research, and reflection
3. Embedding the professional development in educators' work so that it takes place during the school day
4. Supporting and sustaining over time, and
5. Building a sense of collegiality and collaboration among teachers and between teachers and principals in solving important problems related to teaching and learning.

Researchers (Acquarelli & Mumme, 1996; Little, 1993; Loucks-Horsley et al., 1998), and practioners alike agree that effective staff development should be tied

directly to the daily life of the classroom and grounded in the questions and concerns of teachers.

King and Newman (2000) examined teacher learning as it interacts with and impacts the advancement of school goals. They contend that professional development will substantially improve teaching when it happens through the specific contexts in which teaching occurs, when there are supported and sustained opportunities to study and obtain feedback in collaboration with peers, and when teachers have control over the processes of professional development. The need for viewing professional development as an ongoing, systematic strategy for enabling staff members to acquire the knowledge and skills they need for teaching mathematics is shared by both researchers and practioners.

As previously noted, no significant curriculum reform or innovation will be possible without an effective program of teacher professional development. However, teacher professional development alone, regardless of its quality, is not likely to produce significant, sustainable results (Sykes, 1999). Yet, professional development activities have historically targeted teachers as the recipients of reform efforts as if they worked in isolation. Too often, standards-based mathematics professional development activities have focused on just one of the educational constituencies of a school or district, ignoring the essential role that others play in the success of mathematics reform. Not only is leadership generally important, but "the school improvement literature shows fairly clearly that schools are unlikely to be strengthened by either teachers or administrators working on their separate side of the street" (Murphy, 1999, p.9).

Principal's Influence on Teacher Professional Development

Professional development of teachers is one of the key factors and leverage points that make a difference in an educational system. As previously established, it is generally accepted that school leaders play a crucial role in teachers' professional development. Specifically, the principals' support of professional development and the development of collaborative and collegial environments are viewed as central to improvement and change efforts and are directly tied to the actions of instructional leaders.

Given the importance of the principal in determining both the effectiveness of a school and the success of a school improvement effort, it is not surprising that the principal has also been found to play the major role in determining the ultimate value of staff development programs (St. John et al., 1999). Principals typically function as gatekeepers for change and innovation, and the eventual outcome of staff development initiatives often rests upon the guidance and support furnished by the principal (Wood, Thompson, & Russel, 1987). Again and again, the commitment and support of the principal is described as essential to successful professional development programs.

Many researchers suggest (DuFour & Eaker, 1998; Glickman et al., 2001; Smith & Andrews, 1989) that enhancing the growth of teachers is a new role for the leaders. Encouraging and promoting the professional development of teachers is accepted as an important, albeit somewhat new, aspect of the principal's leadership behaviors. Researchers (Blase & Blase, 1999; DuFour, 2002; Sparks, 2004) found that teachers who regard their principals as strong instructional leaders invariably point to the principals' active involvement in professional development activities as evidence

of instructional leadership. Therefore, principals who wish to fulfill the role of instructional leaders must recognize their responsibilities in the development and support of the staffs they are attempting to lead. The commitment and support of the principal is repeatedly described as essential to successful staff development programs. Principals, then, must assume an active part in staff development if meaningful school improvement is to take place.

Instructional improvements present leaders with a complex challenge, requiring them to understand good teaching in the classroom and to be good teachers in working with their staff. The success of school improvement efforts will depend largely on the skills of the professionals within those schools. Principals can create the conditions which ensure that professional growth of the teachers is part of the school culture.

SUMMARY OF LITERATURE REVIEW

The NCTM standards called for significant changes in mathematics classrooms for both teachers and students. These changes proved to be difficult to implement (Cohen et al., 2000; Elmore, 2002a; Silver, 1995). Teachers alone cannot make the types of changes called for by the NCTM standards and Algebra I mandates. The supportive role played by school leaders is a key to implementing the changes called for in the standards.

Changing to standards-based curriculum and instructional practices places a premium on good teaching and requires a major change in the role of the teacher and in that of leaders, primarily the principal (Tsurda, 1998). Meaningful change requires

more than policy mandates, professional development, or new instructional materials. It requires principals who:

1. create a sense of shared urgency around improving the teaching and learning of Algebra I,
2. provide resources that support collaboration among mathematics teachers,
3. provide classroom resources, and
4. provide planned, content-based teacher professional development.

Principals, then, must serve as leaders of instruction. Acting as an instructional leader requires a deep involvement in teaching and learning, as well as, sophisticated views of professional development and teacher support (King, 2002). Principals must know academic content and pedagogical techniques. They must focus on strengthening teaching and learning and professional development. Explicit standards of learning, coupled with heavy pressure to provide tangible evidence of success, have reaffirmed the importance of instructional leadership.

Although the job of school leader has changed dramatically, it appears that neither organized professional development nor formal preparations programs have adequately prepared those holding these jobs to fulfill the role of instructional leader. The general consensus in most quarters is that principal preparation programs, with a few exceptions, are too theoretical and unrelated to the daily demands on contemporary principals (Hale & Moorman, 2003).

As teachers implement important changes, they require continuing programs of professional support (Desimone et al., 2002; Fullan, 1992; Loucks-Horsley et al.,

1998). Although improving teachers' knowledge and skills is necessary for improving student achievement, it is not sufficient. The role of the principal must also be considered. Therefore, improvement efforts must recognize the needs and perspectives of both teachers and administrators.

CHAPTER 3: Research Methodology

This chapter presents the research methodology, study design, and plan for data collection processes. Also included are discussions of the interview protocols, the data analysis techniques used in the study, participant selection, and a description of the concurrent professional development. The qualitative case study employed here was designed to link the data collected to the study's research questions. This research examined the perceptions of high school principals and Algebra I teachers to determine which aspects of concurrent teacher and principal professional development they perceive as critical to their work.

QUALITATIVE RESEARCH DESIGN

A multiple-site case study design was selected because of the nature of the research questions and the need for an in-depth look at the principals, teachers, and campuses. Research using qualitative design provided a useful understanding of the complexities underlying human behavior, including values, actions, relationships and other variables. Unlike other forms of data collection in an education setting, such as surveys or quantitative measurements of performance, the case study was "fundamentally well suited for locating the meanings people place on events, processes, and structures of their lives" (Miles & Huberman, 1994).

The qualitative approach offered a useful avenue for understanding how leadership is defined and implemented, how leaders set priorities and determine

actions, and how they think about and resolve educational problems. These characteristics of leadership are difficult to uncover through surveys and quantitative inquiry (Heck & Hallinger, 1999). Research affirms that studies regarding principals' performance need to provide a description of the instructional leadership of the principal within a specific context and that this may best be done through qualitative measures (Blase & Blase, 1999; Boyan, 1988; DuFour, 2002; Hallinger & Heck, 1996). A multiple-site case study design made it possible to look deeply at teachers and principals to evaluate leadership practices and allowed in-depth responses to questions regarding priorities and actions the principal enacts. Because this study concerned itself with some aspects of leadership, a qualitative approach was warranted.

Yin (1981) recommends the case study approach in situations where no previous research has examined a specific combination of contextual issues. The study undertaken in this dissertation examined such a combination: perceptions of high school principals and lead Algebra I teachers where both principals and Algebra I teachers were engaged in concurrent professional development.

SITE AND PARTICIPANT SELECTION

Site Selection

To determine the interactions between high school principals and lead Algebra I teachers within the context of concurrent professional development activities, five districts involved in an Algebra I school improvement initiative were selected. The

selected districts met the study's requirement of participation in concurrent professional development that involved the high school principal and their Algebra I teachers. Sites were selected from the districts involved in the Partnership for High Achievement where such concurrent professional development in Algebra I was occurring. A description of the concurrent professional development is developed later in this section.

Reputational sampling utilizing Partnership for High Achievement staff was used. Partnership staff identified five district sites where there was a consistently high level of both principal and Algebra I teacher involvement in the Partnership for High Achievement professional development activities. This sampling process resulted in the selection of ten high schools for the study. These schools did not necessarily represent "typical" Partnership for High Achievement sites. This selection process ensured the condition of the research question such that principals and Algebra I teachers participated in concurrent professional development.

Participant Selection

The principal from each high school in each site was selected for participation. Additionally, the high school principal identified one lead Algebra I teacher to be interviewed. This cross-section of participants provided a more accurate and verifiable representation in determining which aspects of the concurrent professional development were perceived as being critical to their respective roles.

Overview of the Concurrent Professional Development

As part of the Partnership for High Achievement, the principals and lead Algebra I teachers participated in up to thirteen days of concurrent professional development. High school principals and lead Algebra I teachers attended six full-day professional development sessions together as part of a District Leadership Team (DLT). These sessions began near the start of the school year and were scheduled approximately every eight weeks. The last session coincided with the end of the school year. Both the high school principals and lead Algebra I teachers were full participants in all the DLT sessions—meaning that they attended every DLT session in its entirety. Other DLT members included key central office staff and other participating district principals and teachers.

The DLT professional development sessions focused on building leaders' capacity to support effective implementation of Algebra I curriculum standards on their campus and in their district. A broad definition of "leader" was utilized within the DLT sessions that included lead Algebra I teachers and department chairs. Partnership for High Achievement internal working documents identify the following concurrent professional development session goals: explore district data to identify root cause of the Algebra I achievement gap; develop a common understanding of the role of the Texas Algebra I curriculum standards in teaching, learning, and assessment; develop a common understanding of research-based best practices for classroom instruction, lesson design, and teacher collaboration; develop a common understanding of effective leadership practices necessary to guide and support change; and provide support in analyzing and using student achievement data in decision making.

In addition to the DLT sessions, the lead Algebra I teachers and high school principals participated in seven corresponding full-day Algebra I professional development sessions and were considered part of the Algebra I Teacher Team (ATT). Together the high school principals, lead Algebra I teachers, selected central office leaders, and all campus-level Algebra I teachers from each high school campus made up the ATT. The ATT sessions started near the beginning of the academic school year and were completed near the end of the school year. These seven sessions were scheduled approximately 5–7 weeks apart. Although the lead Algebra I teachers along with all campus-level Algebra I teachers were full participants in the ATT sessions, high school principals and central office leaders were not. Rather, principal participation in the ATT sessions consisted primarily of participatory visitations of 1–3 hours during most of the seven ATT sessions.

The facilitated ATT sessions utilized a structured, iterative process with Algebra I teachers focusing on the teaching and learning of Algebra I. The Partnership for High Achievement document outlining this process is located in Appendix B. This was accomplished through the development and district-wide implementation of approximately a dozen common lessons and assessment tasks. Algebra I teachers in the ATT sessions collaboratively constructed the common lessons and assessments; generated a non-negotiable implementation timeline; and returned to subsequent ATT sessions with student work samples to be analyzed. Internal Partnership for High Achievement documents identify the following ATT session goals: develop a common understanding of selected Algebra I curriculum standards as they relate to teaching, learning, and assessment; promote collaboration through the development and implementation of common lessons; analyze student work to determine student

understanding of the Algebra I curriculum standards; and analyze student work to determine the effectiveness of the lesson and instructional practice to inform the refinement of both.

DATA COLLECTION PROCEDURES

The Interview

This study utilized a multiple-site case study format. The specific form of case study used is most closely compared to situational analysis: "In this form of case study, a particular event is studied from the viewpoint of the major participants" (Borg & Gall, 1989). Qualitative interviewing assumes that the perspective of others is meaningful and knowable (Patton, 2002). Open-ended interview questions and probes yield in-depth responses about people's perceptions, experiences, opinions, feelings, and knowledge. Crabtree and Miller (1999) indicate that the interview is a research-gathering approach that allows one to construct meaning through an interchange/co-creation of verbal viewpoints.

The purpose of interviewing, then, is to allow us entry into the other person's perspective. Therefore, a standardized open-ended interview protocol with written questions was used during the interviews (Patton, 1990, 2002). The interview was used to "gather descriptive data in the subjects' own words so that the researcher could develop insights on how subjects interpret some piece of their world" (Bogdan & Biklen, 1998). This strategy was used due to its application and appropriateness for addressing and identifying leadership issues (Heck & Hallinger, 1999).

Along with the standardized open-ended interview protocol (see Appendix A), the researcher used an interview guide approach. In this approach the researcher entered the interview session with a plan to explore specific topics and ask specific open-ended questions (Borg & Gall, 1989; Patton, 1990, 2002). These questions were developed by a review of effective schools, professional development, and instructional leadership research. Research staff at the Charles A. Dana Center provided additional assistance in the development and review of the interview protocols (Appendix A). Additionally, the interview protocols were piloted with other Partnership for High Achievement participants who were not part of this study.

Data Collection

Data collection procedures followed the recommendations of Bogdan and Biklen (1998), Johnson and Christensen (2000), and Patton (1990, 2002) in that the primary source of data was semi-standardized, structured, one-on-one reflective interviews enlisting the use of open-ended questions. This approach required carefully and fully wording each question before the interview to ensure that each interviewee was asked the same questions, in the same way, and in the same order (Patton, 2002). There are four major reasons for using standardized open-ended interviews (Patton, 2002):

(1) The exact instrument used is available for inspection by those who will use the study,

(2) Variation among interviewers can be minimized,

(3) The interview is highly focused, using time efficiently, and

(4) Analysis is facilitated by making responses easier to find and compare.

A mix of interpretive, descriptive, and evaluative questions was used. What the researcher proposed to do was to turn the principals' and teachers' reflective interview narrative into data for use in describing the critical components of concurrent professional development as well as to determine the nature of the usefulness of the components to the participants. The responses from multiple subjects were used to form a composite description.

The interviews were intended to generate evidence from which the usefulness of professional development activities were ascertained. Interview responses were coded in order to identify key themes and patterns emerging from the data. This coding of data provided a process of analysis to shed light on the "what" and the "how" of concurrent professional development activities (Bogdan & Biklen, 1998). The researcher looked for patterns, themes, and regularities as well as contrasts, paradoxes, and irregularities.

The interviewees were allowed unlimited time to respond to the questions. In conjunction with the predetermined questions, the interviewer occasionally asked probing follow-up questions to promote elaboration and/or clarification. When a response pattern emerged between subjects, similar, probing follow-up questions were asked of the other participants. All interviews were tape-recorded, which allowed the interview interaction to be as open and free as possible and also allowed for accurate transcription of each interview.

DATA ANALYSIS

Coffey and Atkinson (1996) describe a method to move from coding to interpretation of data: (1) retrieve and categorize data to re-conceptualize and display it in such a way that it can be read easily, (2) explore the codes and categories to be created, and (3) transform the data into meaningful data. Codes should be the link between the raw data and the theoretical and conceptual orientations of the researcher. Coffey and Atkinson (1996) stress that coding may be part of the process of analysis but it should not be thought of as the entire process. Research experts (Bogdan & Biklen, 1998; Miles & Huberman, 1994; Patton, 1990, 2002) conclude that coding is a main analytical tool in qualitative research but should not be the main focus of the analytical process.

Coding is the process by which concepts or themes are identified and developed in terms of their properties and dimensions. The researcher used basic analytic procedures to accomplish coding by

1. Questioning the data;
2. Comparing similarities and differences between interviewees' responses on questions; and
3. Grouping and coding similar responses into categories.

In order to develop adequate familiarization with the data, each transcript was read and reread several times. To construct meaning from each interview, the researcher analyzed the data as it was collected. Notes were made and passages highlighted in an attempt to become immersed in and familiar with the data. A variety of methods were then utilized to code the data. Using sentences and phrases as the coding unit, transcripts were cut apart and arranged physically on poster paper and/or

index cards. In some cases the data were also color-coded to indicate emerging themes: this was the case when data crossed over into one or more categories. Additionally, some data were entered into a database for further coding and analysis. The thematic coding process employed in this study required initial coding of the data, followed by a re-coding of the data as provisional themes developed. The coding process and various displays of data allowed for exploration of relationships among themes.

The use of the above analytic procedures allowed the researcher to make connections between categories and its subcategories and reassemble data in new ways. Data were coded for inductive categories and themes. This included coding for important concepts and themes, organizing theoretical codes, and creating narrative summaries. Interview transcripts were analyzed for the following: repetition within and across the interviews; levels and nature of effect; explicit and implicit interpretation. The use of both principal's and teacher's interview responses provided the researcher the ability to analyze the data from multiple perspectives and to triangulate the data.

A review of literature in sociology, anthropology, and education supports common rules of thumb for data analysis on which researchers concur (Bogdan & Biklen, 1998; B. Johnson & Christensen, 2000; Patton, 2002; Strauss & Corbin, 1998):

1. Look for the meaning and perspectives of the participants in the study.
2. Look for relationships regarding the structure, occurrence, and distribution of events over time.

3. Look for points of tension: What does not fit? What are the conflicting points of evidence in the data?
4. Look for emergent patterns in the data. What is common in the responses? Why does this commonality exist?

The described standardized open-ended interview techniques and data collection and analysis were useful in providing "description or conceptual ordering (classifying and elaborating)" by the interviewee (Strauss & Corbin, 1998, p. 9). The data gleaned from the responses of the high school principals and lead Algebra I teachers provided insights into the usefulness of concurrent professional development. The multiple data sources not only provided the opportunity for data triangulation, but also allowed the researcher to discern patterns of interactions.

Researcher Bias

Collecting and analyzing data while keeping what Patton (2002) calls "empathetic neutrality" was be a constant concern for the researcher. The researcher was careful to be unbiased in collecting, recording, and classifying the data for this study. To prevent what Johnson and Christensen (2000) call "researcher bias" the researcher must be reflexive, which means that "the researcher actively engages in critical self reflection about his potential biases and predispositions" (p. 207). Another method that prevented researcher bias was the multiple data sources. An intermixing of interviews of all principals and lead Algebra I teachers prevented errors linked to one single case and provided cross data validation. This allowed for the understanding

of inconsistencies and identification of emergent patterns provided by a variety of responses.

SUMMARY

The qualitative multiple-site case study design employed here was selected in order to link the data collected to the study's research questions. The research design was characterized by four features of a case study approach in qualitative research outlined by Johnson and Christensen (2000): (1) describing one or more cases in-depth and addressing the researcher's questions and issues; (2) incorporating holistic description and thematic data analysis; (3) conducting narrative reports containing rich descriptions of the context and operation of the case including discussions of themes, issues, and implications; (4) interpreting results through theoretical and disciplinary origins from business, the social sciences, and education. The strength of qualitative research, for both researcher and subject, is its ability to focus on actual practice *in-situ*, observing how social interactions are routinely enacted (Silverman, 2000).

CHAPTER 4: Research Findings and Data Analysis

Chapter Four presents an analysis of data describing high school principals' and lead Algebra I teachers' perceptions of concurrent Algebra I professional development on matters of curriculum, instruction, and assessment. This chapter is divided into three sections. The first section is an overview of the study. The second section presents the district, campus, principal, and teacher profiles. The third section presents the descriptive findings and analysis addressing the research questions that guided this study.

OVERVIEW OF THE STUDY

Purpose

Rising expectations, the mathematics standards movement, and state and federal assessments and accountability systems establish new measures by which schools are held accountable. Awareness is growing among policy and decision makers that administrators and teachers require richer, more focused opportunities to learn, particularly in the context of new standards and high stakes accountability.

There exists extensive research and literature indicating that the professional development of teachers is a key ingredient in improving our schools. Similarly, much has been written suggesting that transforming principals into instructional leaders via professional development is key to improving our schools. Typically, however, principal and teacher professional development activities have been

conducted independently of one another. Frequently this results in a fragmented approach to school improvement.

Because conventional approaches to in-service are typically targeted at either teacher or principal audiences and are widely decried as inadequate, there is value in examining the potential of concurrent principal and teacher professional development. The purpose of this study was to examine the perceptions of high school principals and Algebra I teachers to determine which aspects of concurrent teacher and principal professional development they perceive as critical to their work. To that end, this research study was guided by the following two research questions:

1. What components of concurrent professional development do teachers and principals perceive as important to them in improving Algebra I curriculum, instruction, and assessment?

2. In what ways are these perceived components important?

Methodology

This multiple-case study format utilized reputational sampling to select ten high school principals and teachers for individual interviews. All principals and teachers interviewed participated in the Charles A. Dana Center's 2003-04 Partnership for High Achievement initiative in which concurrent principal and teacher professional development is a key feature. Interviews were conducted near the end of the 2003-04 academic school year.

Qualitative findings were derived from applying analytic procedures previously described in this study to data obtained through interviews with principals and teachers. More than 30 hours of open-ended, qualitative interviews were tape-recorded, transcribed, and examined to identify elements and categories. Participants were asked similar questions about a fixed set of topics; however, additional questions specific to each participant were included. The interviews allowed for exploration of lead Algebra I teachers' and high school principals' perspectives regarding concurrent professional development activities. The use of an open-ended interview protocol allowed for rich data to be gathered. The interview narratives provided insight on which aspects of concurrent professional development high school principals and lead Algebra I teachers perceived as important and in what ways these aspects were important.

The principal and lead Algebra I teacher narratives were used as data to identify and categorize perceptions of the importance of concurrent professional development components. The researcher coded the interviews to identify key themes and patterns emerging from the data. Coding the data provided the researcher a process of analysis that shed light on the "what" and "how" of the concurrent professional development components.

Coding is the process by which concepts or themes are identified and developed in terms of their properties and dimensions. The researcher used basic analytic procedures to accomplish coding by

1. Questioning the data;
2. Comparing similarities and differences between interviewees' responses on questions; and

3. Grouping and coding similar responses into categories.

The use of the above analytic procedures allowed the researcher to make connections between categories and subcategories and reassemble data in new ways. Data were coded for inductive categories and themes. This included coding for important concepts and themes, organizing theoretical codes, and creating narrative summaries. Interview transcripts were analyzed for the following: repetition within and across the interviews; levels and nature of effect; and explicit and implicit interpretation. Various literatures cited herein informed analysis.

Data analysis included strategies to address each research question. These categories were further analyzed to identify critical incidents, frequency, and connections through constant comparison (Strauss & Corbin, 1998). In drawing interpretations from data, validity and reliability were attended to in several ways. These included employing various analytic strategies, triangulating data, and utilizing other Dana Center researchers. For example, coding schema, data displays, evolving interpretations, and other aspects of analysis were discussed with other researchers in order to incorporate alternative interpretations. Throughout each analytic phase, both "confirming" and "disconfirming instances" of themes were examined (Miles & Huberman, 1994).

The data gathered is a descriptive account of participant perceptions of concurrent professional development and the significant aspects of concurrent professional development. Two themes that emerged from the interviews provided information and insight regarding the research questions. These themes were (1) the development of common understanding and shared vision and (2) the emergence of instructional program coherence.

PRINCIPAL, LEAD ALGEBRA I TEACHER, CAMPUS, AND DISTRICT PROFILES

Principal

Ten high school principals from five different districts were interviewed. All ten principals are considered experienced, with each having a minimum of 23 years' experience in education and at least 10 years' experience in school leadership. All but one of the principals interviewed had been at the same campus for more than five years. The one principal had been appointed to a new building, and hence had one year of experience at that particular building. Of the ten high school principals, four were white, two African American, and four Hispanic. Five of the principals were female and five male.

Lead Algebra I Teachers

Like the principals, the lead Algebra I teachers had considerable classroom experience. All but one had more than 12 years' teaching experience. Three had more than 20 years of experience. Three of the ten lead Algebra I teachers had experience teaching outside the area of mathematics—one each in computer programming, science, and business education. Most of the lead Algebra I teachers served as mathematics department chairpersons and had done so for a number of years, though one of these teachers had only recently been assigned as department chair. In three situations, the lead Algebra I teacher was not the department chairperson but served as the departmental resident expert in Algebra I. In addition to teaching Algebra I, most taught at least one other mathematics course. Of the Lead Algebra I teacher group,

seven were white, one Asian American, and two Hispanic. Eight of the lead Algebra I teachers were female and two male.

Campus and District

The participating campuses and districts varied in student enrollment, student demographics, geographic location, campus enrollment, and student achievement levels. The high school enrollment ranged from 105 to 2,399 students. The smallest high school, with 105 students, was a new campus, opening in the 2003-04 school year with only a freshman class; additional grade levels will be added each subsequent year. Districts ranged from the largest in the state at 211,762 students enrolled in prekindergarten through grade 12 to a district with just more than 2,000 students.

The schools in this study reflect state-level Algebra I enrollment trends, meaning although some Texas eighth grade students enroll in Algebra I, the vast majority of students enrolled in Algebra I are in ninth grade. Therefore, grade nine student achievement data was selected for illustrative purposes. Although this study did not seek to determine the effect of concurrent professional development on student achievement, data from the grade nine Texas Assessment of Knowledge and Skills (TAKS) at panel recommendation are reported in Tables 4.1 through 4.5 and are intended to illustrate the broad range of schools upon which this study is based. Panel recommendation scores represent the percentage of students meeting the highest of the state-developed phase-in standards. Student achievement data for the campuses and districts vary considerably. Some had student achievement scores well above the state average while others had scores well below the state average. The districts and

campuses where student achievement data were well above state average remained 15 to 30 points above state average over the two-year period from 2002-03 to 2003-04. These districts' recorded gains in student achievement were typically 1 to 2 points less than the average state gains. Districts and campuses whose student achievement data were slightly below or at state averages showed gains slightly above the average state gains. Mixed in with these modest gains are gains in some demographic groups that were double and triple the gains at the state level.

Again, the student achievement data is provided for illustrative rather than analytic purposes with the express intent of showing the diversity of the sites selected for this study. The differences in student achievement gains across sites may be due in part to the relative student achievement starting points. Those districts with lowest initial starting points clearly have more room for improvement than those who started 20 to 30 points above state average.

Tables 4.1 through 4.5 show the specific student enrollment, demographics, and student achievement for the districts and campuses in this study. These tables show student achievement for the following student groups: All Student, African American, Hispanic, White, and Economically Disadvantaged. It is important to note that student demographic groups are not necessarily mutually exclusive. A student who is White and Economically Disadvantaged is included in calculation of the All Student, White, and Economically Disadvantaged demographic groups. State data is provided for comparison.

Table 4.1: State/District A/Campus A-1 Comparison

District/Campus Enrollment	Student Demographics 2003-04	Grade 9 Texas Assessment of Knowledge and Skills (TAKS) (percent meeting Panel Recommendation)				
		Student Group	2003		2004	
			Math	Reading	Math	Reading
		All	44	66	50	76
STATE	14% AA	AA	27	55	33	66
	43% H	H	30	54	37	66
4,239,991	40% W	W	60	79	67	88
students	52% Ec.D.	Ec.D.	28	52	35	65
		All	59	69	61	86
DISTRICT A	14% AA	AA	29	63	35	94
	43% H	H	50	50	49	73
3,349	40% W	W	62	71	64	87
students	52% Ec.D.	Ec.D.	44	53	45	78
		All	59	69	61	86
CAMPUS A-1	14% AA	AA	29	63	35	94
	43% H	H	50	50	49	73
897	40% W	W	62	71	64	87
students	52% Ec.D.	Ec.D.	44	53	45	78

Table 4.2: State/District B/Campus B-1, B-2, B-3, B-4 Comparison

District/Campus Enrollment	Student Demographics 2003-04	Grade 9 Texas Assessment of Knowledge and Skills (TAKS) (percent meeting Panel Recommendation)				
		Student Group	2003		2004	
			Math	Reading	Math	Reading
		All	44	66	50	76
STATE	14% AA	AA	27	55	33	66
	43% H	H	30	54	37	66
4,239,991	40% W	W	60	79	67	88
students	52% Ec.D.	Ec.D.	28	52	35	65
		All	69	91	72	95
DISTRICT B	0.5% AA	AA	--	--	--	--
	75% H	H	65	91	67	95
2,007	18% W	W	82	91	93	96
students	50% Ec.D.	Ec.D.	65	90	64	93
		All			54	86
CAMPUS B-1	0% AA	AA			--	--
	89% H	H	No	No	47	85
105	10% W	W	data	data	100	100
students	82% Ec.D.	Ec.D.			46	87
		All	71	93	70	96
CAMPUS B-2	1% AA	AA	--	--	--	--
	80% H	H	70	94	66	95
636	11% W	W	87	94	93	100
students	50% Ec.D.	Ec.D.	71	92	64	93
		All	81	96	89	100
CAMPUS B-3	0% AA	AA	--	--	--	--
	64% H	H	76	96	83	100
590	28% W	W	72	98	100	100
students	40% Ec.D.	Ec.D.	76	96	82	100
		All	50	81	60	89
CAMPUS B-4	0% AA	AA	--	--	--	--
	79% H	H	47	82	58	92
676	16% W	W	65	72	69	80
students	53% Ec.D.	Ec.D.	42	79	56	86

Table 4.3: State/District C/Campus C-1 Comparison

District/Campus Enrollment	Student Demographics 2003-04	Grade 9 Texas Assessment of Knowledge and Skills (TAKS) (percent meeting Panel Recommendation)				
		Student Group	2003		2004	
			Math	Reading	Math	Reading
		All	44	66	50	76
STATE	14% AA	AA	27	55	33	66
	43% H	H	30	54	37	66
4,239,991	40% W	W	60	79	67	88
students	52% Ec.D.	Ec.D.	28	52	35	65
		All	71	91	73	94
DISTRICT C	7% AA	AA	--	--	45	88
	9% H	H	57	78	62	87
12,508	78% W	W	73	93	77	87
students	7% Ec.D.	Ec.D.	41	65	50	79
		All	71	91	74	94
CAMPUS C-1	5% AA	AA	--	--	47	88
	7% H	H	57	78	64	89
960	83% W	W	73	93	77	95
students	5% Ec.D.	Ec.D.	41	65	51	79

Table 4.4: State/District D/Campus D-1, D-2 Comparison

District/Campus Enrollment	Student Demographics	Grade 9 Texas Assessment of Knowledge and Skills (TAKS) (percent meeting Panel Recommendation)				
		Student	2003		2004	
		Group	Math	Reading	Math	Reading
		All	44	66	50	76
STATE	14% AA	AA	27	55	33	66
	43% H	H	30	54	37	66
4,239,991	40% W	W	60	79	67	88
students	52% Ec.D.	Ec.D.	28	52	35	65
		All	37	64	46	75
DISTRICT D	18% AA	AA	22	55	33	69
	44% H	H	30	55	37	68
18,765	37% W	W	51	77	61	86
students	58% Ec.D.	Ec.D.	26	53	36	67
		All	31	60	41	71
CAMPUS D-1	19% AA	AA	16	51	30	62
	47% H	H	27	54	35	67
2,319	33% W	W	45	75	56	83
students	59% Ec.D.	Ec.D.	25	52	35	66
		All	44	68	52	80
CAMPUS D-2	17% AA	AA	30	60	36	75
	30% H	H	34	57	41	69
2,399	52% W	W	56	79	64	87
students	34% Ec.D.	Ec.D.	30	54	38	69

Table 4.5: State/District E/Campus E-1, E-2 Comparison

District/Campus Enrollment	Student Demographics	Student Group	Grade 9 Texas Assessment of Knowledge and Skills (TAKS) (percent meeting Panel Recommendation) 2003 Math	2003 Reading	2004 Math	2004 Reading
		All	44	66	50	76
STATE	14% AA	AA	27	55	33	66
	43% H	H	30	54	37	66
4,239,991	40% W	W	60	79	67	88
students	52% Ec.D.	Ec.D.	28	52	35	65
		All	29	55	35	68
DISTRICT E	31% AA	AA	21	53	26	66
	57% H	H	24	49	30	64
211,762	9% W	W	65	83	74	90
students	80% Ec.D.	Ec.D.	23	49	29	63
		All	13	47	21	62
CAMPUS E-1	20% AA	AA	3	52	14	55
	76% H	H	14	46	22	64
2,319	3% W	W	25	67	60	70
students	87% Ec.D.	Ec.D.	13	46	21	62
		All	24	42	36	66
CAMPUS E-2	2% AA	AA	44	50	17	86
	96% H	H	23	42	36	66
2,399	1% W	W	38	43	67	100
students	92% Ec.D.	Ec.D.	25	42	36	66

FINDINGS AND ANALYSIS OF DATA

This section is divided into two parts. The first part analyzes the findings from Research Question One. The principals and teacher identified three components of the concurrent professional development that they perceived as most important. These components are described in the first part of this section. The second, far longer, part of this section analyzes the findings from Research Question Two. This question attempted to determine the ways in which the identified professional development components were important and the findings reveal the significance of two themes in the principals' and lead Algebra I teacher' perceptions. In this part of this section each theme is discussed in terms of each of the three components identified by the principals and teachers. Discussion of the findings and their significance is presented from both principal and teacher perspectives.

Research Question One

The intent of Research Question One was to ascertain which components of the concurrent professional development principal and lead teachers perceived as being most important to them in matters of Algebra I curriculum, instruction, and assessment. Their responses consistently pointed to three components: (1) Data Scan, a presentation of student achievement data, (2) Gap Analysis, a self-assessment process, and (3) the development of Common Lessons and Assessments Tasks. A description of each of these three components is provided below.

Concurrent Professional Development Component 1: Data Scan

This component, which launched the Partnership for High Achievement work, involved a facilitated, neutral review and analysis of the Texas Assessment of Knowledge and Skills student performance data. Campus-level and district-level student achievement data and course passing/credit earning data were provided for each campus. Data for all student demographic groups were also presented. Comparison data, including but not limited to state-level data, was used to assist campuses and districts in developing an understanding of their current state. The intent was to illuminate areas in which the campuses were making progress, as well as those where improvement was needed, and to do so in an objective, non-judgmental manner.

Concurrent Professional Development Component 2: Gap Analysis

The Gap Analysis component utilized a facilitated process to benchmark current campus and district practices against those of high performing schools. This was accomplished by comparing crucial characteristics of high performing schools to the current campus and district practices. Participants reviewed key practices found in high performing schools and districts and, based on their perspective and position in the district, offered evidence depicting current campus and district practices. The complete Gap Analysis document can be found in Appendix C. The full set of evidence was then shared with the entire DLT who reviewed and analyzed the evidence. Next, using the key characteristics of high performing schools, participants collaboratively generated an "ideal state" or concrete vision of teacher and leadership behaviors. See Appendix D for an example. The intent of the Gap Analysis

component was to highlight key characteristics and practices found in high performing schools and districts so as to establish a vision and direction for improvement. Subsequent DLT sessions assisted participants in achieving their "ideal state."

Concurrent Professional Development Component 3: Common Lessons and Assessment Tasks

Common lesson and assessment tasks were developed within the facilitated ATT sessions. A structured, iterative process (see Appendix B) was utilized to collaboratively develop approximately ten to twelve common lessons and assessment tasks to be implemented by every Algebra I teacher on the campus. Algebra I teachers in the ATT sessions collaboratively constructed the common lessons and assessments; generated a non-negotiable implementation timeline; and returned to subsequent ATT sessions with student work from the common lessons and assessment tasks. Portions of each ATT session were devoted to analyzing the student work derived from the common lessons and assessment tasks.

Coding and Analysis Process

Although participants were not typically able to provide the "title" of the component, the researcher utilized the participants' descriptions of the activities to identify and label the concurrent professional development component. For example, one principal stated, "the most important learning was the need to think about and move toward looking at the program from a district-wide level, rather than just the

campus or teacher level." This response was coded to the Gap Analysis component as it highlights the notion of and benefits of a district-wide Algebra I program.

Additionally, one of the lead Algebra I teachers commented:

> "I thought the most important thing was when we saw other people's perceptions. The range of perceptions that people had about what the school district was doing. Because this district has a high reputation, I was expecting to come into a well-oiled, running machine—where everyone was working in harmony and had the same expectations. We found out that that was not necessarily the case and that everyone was doing different things and had different perceptions."

Although this participant's response highlights an idea quite different from the previous participant, this response, too, was coded to the Gap Analysis component. Despite participants' inability to "label" the concurrent professional development session, their descriptions were such that the researcher was able to match the descriptions to the actual components.

The Data Scan component was frequently sited as being important. The nature of the participant comments often centered on the goal-setting aspect. As one lead Algebra I teacher said, "It gave us OUR goal—what we want to achieve. It helped us to make a plan of action. We set a reasonable, achievable goal. It showed where we want to go in three years and how far we have to go." Participants also focused on the informative aspect of this component. One principal reported, "The data that was presented was important. For us to be able to look at that data and digest it and for us to hear what it means—what it shows about our strengths and weaknesses. It gave us the direction and the goals that we want to go to." Another principal indicated that

although he was familiar with the campus's student achievement data, his teachers were not.

Lead Algebra I teachers frequently indicated the Common Lessons and Assessment Tasks component as a key component. A lead Algebra I teacher reported, "Having our campus work together with other campuses to create and share lessons and strategies—what works and what doesn't—has been most helpful. Everyone tries the same lessons. It's not just one teacher deciding for themselves."

Despite the varying participant responses, all of the above data examples were all coded to the Data Scan component. The coding and analysis processes employed in this study required a conceptual understanding of both the Partnership for High Achievement project and the day-to-day working of schools and those who work in them on the part of the researcher.

Research Question One Summary

Research Question One attempted to determine which components of concurrent Algebra I professional development high school principals and lead Algebra I teachers perceived as being significant in improving curriculum, instruction, and assessment in Algebra I. Overwhelmingly, both principals and lead Algebra I teachers identified three components: (1) Data Scan, (2) Gap Analysis, and (3) Common Lessons and Assessment Tasks. Principals and teachers alike were unanimous in their selection and citation of the three components analyzed here. Although other components existed within the concurrent professional development

project, only the Data Scan, Gap Analysis, and the development of Common Lessons and Assessment Tasks were mentioned in relation to Research Question One.

Although the findings related to Research Question One are important, they are rather one-dimensional. It is through the investigation of Research Question Two that the significance of the components identified in Research Question One is illuminated.

Research Question Two

In contrast to Research Question One's one-dimensional findings, Research Question Two, which attempted to determine the ways in which the concurrent professional development components were important to high school principals and lead Algebra I teachers, exposed broad variation. The findings surrounding Research Question Two reveal interesting and important phenomena.

Analysis of data related to Research Question Two, the ways in which the concurrent professional development components were perceived to be significant, surfaced two recurring themes: (1) development of common understanding and shared vision, and (2) emergence of instructional program coherence. Descriptive data related to Research Question Two are the focus of this section, which is divided into two parts—one part for each theme. The three components from Research Question One are discussed in relation to each theme.

Theme One: The Development of a Common Understanding and Shared Vision

Theme One, the development of a common understanding and shared vision emerged from the data and is described below. At the core of Theme One are vivid descriptions of and the importance of teachers and leaders co-developing a common understanding of the "current realities" and the "envisioned future" of their Algebra I programs.

Component 1: Data Scan

Bernhardt (1998) indicates that schools that analyze data and utilize information about their school community make better decisions about not only what to change, but how to change. The high school principals and lead Algebra I teachers in this study concur with Bernhardt's idea. Both the principals and lead Algebra I teachers identified the presentation of student achievement data as the starting point for building an improvement plan for Algebra I. Principals and lead Algebra I teachers universally reported that the significance of the Data Scan component lies in the resulting collective understanding of state of the Algebra I program.

Although many of the high school principals expressed a prior familiarity with their data, each indicated that use of comparison data in the session had validated what they already intuited while simultaneously illuminating new issues and concerns regarding curriculum, instruction, and assessment practices in their Algebra I classrooms. One principal reported, "We always go through our assessment results and look for areas of weakness. But we saw the district-wide picture, other campuses in the district, and other top schools. The numbers [comparison data] showed us where

we were. We could see the gaps and the problem areas." Participants indicated that the data presentation "brought an awareness" that did not previously exist and "showed the need for improvement"—something campus and district leaders had been unsuccessful in doing. They reported that the use of comparison data made apparent previously unnoticed gaps in student achievement performance and created a heightened sense of concern and urgency on the part of principals and teachers alike.

Unlike the principals, who professed a high level of familiarity with their data, lead Algebra I teachers rarely indicated a similar awareness and were even less familiar with the comparison data provided. One teacher explained, "We saw the big picture. We saw the gaps and that there was a need for improvement. We were able to talk about whether or not our students were being successful." Despite the differences in familiarity with their data, both groups agreed that the concurrent professional development activities provided opportunity for and facilitation of collaborative examination; they also agreed that dialogue around the data was necessary and meaningful, and that new insights were gained. As one teacher stated, "It [the data] brought an awareness that Algebra I performance is important. All of us being in the same room was useful. We all saw where we are and where we need to be. We all saw that we have a long way to go."

Most principals reported that engaging in data analysis activities with their lead Algebra I teachers created a deeper understanding and ownership of the data on the part of teachers—suggesting that prior to the concurrent professional development session, teachers had not taken ownership of the student achievement data. One principal said, "The process of examining the data validated the need for improvement. We all saw the same numbers together." In short, principals believed

that teacher ownership of the data was created through involvement in the analysis of their campus and district data, and that this was accomplished through participation in the concurrent professional development session.

Most lead Algebra I teachers reported that access to data—an opportunity to explore, analyze, and discuss the data with their colleagues and principal—was significant in developing acceptance of the data and its findings. They indicated that they were provided a safe environment for exploration and discussion of the data. Furthermore, teachers consistently reported valuing the participatory nature of the data analysis activities, and that this, in turn, led to a deeper understanding and broad acceptance of the data. For example, one lead Algebra I teacher noted, "I do analysis of my own scores. But being together with the principals and others across the district to analyze the data was good. We were in teams looking at all of our data. All of us being together really gave us a chance to see where we were." Principals and teachers frequently indicated that examining their student achievement data as a group afforded them a collaborative, non-threatening opportunity to view the data from a shared perspective. They often discovered that students were not performing at the level they previously assumed. One principal interviewed said, "It gave us a new perspective. The statistics that were presented was an analysis of our work. It [the results of our previous work] was put out in the open. And seeing that was an eye-opener." Principals and lead teachers recognized that student achievement data could play an informative, positive, and formative role in creating motivation for improving the Algebra I program. This notion was particularly heartfelt by one teacher:

> Our job is to try to reach every student. It's [the data] pushing us to achieve that. Everyone! It's [the data] pushing us to achieve and not be satisfied with just the scores we've been getting—with some kids not making it. We have to

> do better. Thirty-five percent of our students not passing is not OK. We need to keep trying to figure out what we can do to help those students who are not achieving. The data is pushing us to make sure all students are reached.

This teacher was not alone in her desire to attend to every student. Another lead Algebra I teacher stated,

> It was a big discussion. Our superintendent let us [principals and lead Algebra I teachers] know pretty quickly how important it was for us to shoot for 100% [of students passing]. We just did not realize how important that was. We were shooting for what we thought we could more realistically accomplish. We were a little bugged by that [superintendent's 100% goal] at first. But we didn't realize that we were saying "we're going to leave out some kids." Well, that shouldn't be our goal—to leave out some kids. Our goal should be every kid. That was good. It was a good conversation.

Both groups agreed that the collective generation of knowledge regarding the current state of the Algebra I program and its related data was viewed as a significant impetus for improvement.

High school principals and lead Algebra I teachers in this study repeatedly stated how important it was that current data be shared and understood by the staff. One teacher concurred: "I remember being surprised by it [the data]. It sure got our attention!" A principal said,

> The concept of getting us all together [teachers, principals, central office] in a more formal fashion with the purpose being improvement was good. We're all one the same page. We all have the same desire for our students, ourselves, and for the district. We couldn't have done this without coming together to have conversation and talk.

Through the process of viewing the data collectively as a team, principals and teachers reported that they had developed a shared understanding of where they were. A growing body of evidence from research and practice supports this perspective—that the development of an understanding of data and the use of targeted assessment data

can be used to motivate and guide improvement. The significance of collaborative, careful data analysis as a starting point for improvement efforts is documented in numerous studies, including that of Cawelti and Protheroe (2001) who studied six school districts that had significantly increased student performance on state-mandated tests. All of the districts in their study began improvement efforts by carefully and collaboratively reviewing assessment data.

Both teachers and principals in this study viewed the co-generation of knowledge of the current state of their Algebra I program through an examination of related data as a significant stimulus for improvement; the collaborative processes provided a common understanding of the need for change. For example, a principal reported, "The data was preparation to get them [teachers] working together and to think about what follows." Research on instructional leadership, organizations, and schools often cites the importance of vision and goal setting as an essential starting point. A shared vision is viewed as being valuable for a learning organization because it provides a focus and energy for learning (Fullan, 2002). This study confirms the importance of such a notion. The co-development of measurable, shared goals created a sense of inclusion, autonomy, and direction that teachers had typically not experienced before. One teacher noted, "When we [lead teachers and principals] were together we heard the same things, saw the same data, heard the various perceptions. Now we can move together as a district." This is significant in that teacher participation in decision making has been found to be important for the successful implementation of large-scale innovations by teachers (Darling-Hammond & Sykes, 1999; Smylie & Hart, 1999). As one principal stated, "Okay, everyone is on the same page now." Lead Algebra I teachers and principals together carried out the key

instructional leadership tasks of (1) providing vision and direction for the Algebra I program and (2) setting a constructive tone and high expectations.

Component 2: Gap Analysis

Participants reported that the Gap Analysis component produced relevant information regarding the realities of their current state. A teacher from one of the highest performing districts in the sample said,

> The Gap Analysis was really important for us [the district]. I really enjoyed that—[laughter]—or I don't know if "enjoy" is correct. It was so interesting—the different range of perceptions that teachers, principals, and central office had about what the district was doing. The teachers and principals all had different ideas about what we thought we were doing and not doing.

The Gap Analysis process required total honesty—according to one teacher, "We told it like it was, the way things really are, the way we really do things." Any organization attempting to improve must first "confront the brutal facts about itself" (Collins, 2001). Principals and teachers in this study concurred. The following statement from a principal is indicative of the participants interviewed:

> Through the process we realized that we had no structures or systems. The process really gave us a chance to see where we are. It forced us to look at ourselves . . . it helped us acknowledge that we needed to do things differently. We realized that most teachers and administrators were doing their own thing. Teachers didn't agree on what should be taught. Everyone in the room was saying "I had no idea" and "I didn't know that."

This candor was cited as critical in establishing a starting point and generated some moderately startling findings for the principals and lead Algebra I teachers. These primary findings were as follows: their Algebra I program lacked cohesion and

consistency; limited and unfocused monitoring of the curriculum occurred; extensive individual teacher autonomy was exercised when it came to matters of curriculum, instruction, and assessment. In short, there was no non-negotiable curriculum; inadequate and fragmented systems were in place district- and campus-wide to ensure the occurrence of adequate leader, teacher, and student learning. The collaborative uncovering of these issues served to deepen participants' understanding of the current reality and acknowledge the need to change the way they approach the teaching of Algebra I.

One key idea appeared to be the development of a "common understanding" of the current reality, which included the student achievement assessment data presented in the Data Scan component as well as the evidence generated from participants' self-assessment in the Gap Analysis process. Participants recognized and accepted that the status quo was not working. Both the principals and teachers frequently described their involvement in the development of the goals as a way to create a sense of inclusion and buy-in. One principal noted,

> The data that was presented allowed us to be able to look at that data and digest it and for us to hear from somebody else what it means, what it shows, and what it doesn't show. This gave us direction and the goals that we want to go to. It was enlightening and validating. It got us together. We realized that we're all in the same boat. It got us to go to the next step. We have the same desire for our students, for ourselves, and for the district. We can improve and we can do so by working together.

More often than not, principals and teachers were in agreement and cited the notion of the "non-negotiable curriculum" as their starting point for program improvement. Principals and lead Algebra I teachers both made statements to the effect of "there needs to be consistency across the board." Participants viewed the concurrent professional development as a way to attain consensus on the Algebra I

curriculum. One principal suggested that the concurrent professional development was "a vehicle to get all of our Algebra I teachers together to agree on the curriculum." In fact, the "non-negotiable curriculum" became a rallying point for lead teachers and principals alike. Lead Algebra I teachers frequently indicated that they were attempting to deliver common lessons "in coordination with all the other teachers in the department." One teacher continued, "We all do the lessons and give feedback on what went well and what didn't. We ALL do the lessons. We try to keep track and make sure that everyone implements the lessons."

Principals and teachers reported that the concurrent professional development setting afforded them an opportunity to come to agreement on the necessity of establishing and monitoring the non-negotiable curriculum. One principal recalled the initial gap analysis question: "The first question asked was about the non-negotiable curriculum. We realized we didn't have one—but that a common, non-negotiable curriculum was necessary if we want all kids to achieve." Although not everyone in the schools embraced the idea of a non-negotiable curriculum, lead Algebra I teachers and principals were quick to recognize the benefits for themselves, their colleagues, and their students. The list of potential benefits included increased continuity and cohesion for students; greater opportunities for teacher collaboration; increased horizontal and vertical alignment; clarification of what and how to monitor; and development of common, unified vision and goals for the Algebra I program.

Component 3: Common Lessons and Assessment Tasks

Algebra I teachers credit the establishment of a non-negotiable Algebra I curriculum with creating the need for and acceptance of the development and district-wide implementation of common lessons and assessments. One teacher described her campus's approach to teaching Algebra I in the following way: "Some teachers would really teach Algebra I and some wouldn't. We didn't all teach the same topics. We all had our own ideas of what Algebra I was. We all had our own bag of tricks." Another lead Algebra I teacher agreed, "We all did our own thing. It went as far as us using eight different textbooks. We all had our own way of doing things—the order, materials, tests, everything!" Adopting a non-negotiable curriculum through a set of common lessons and assessment tasks was viewed as a significant change due to the extensively documented autonomy of teacher practice at both the district and campus levels.

Although not everyone at the schools welcomed the idea of a non-negotiable curriculum, concurrent professional development set the stage for the development of shared standards and expectations for curriculum, subject matter instruction, and student achievement goals. Participants frequently referred to "bringing teachers together to determine what should be taught and how" as one of the critical pieces of the concurrent professional development. Several principals noted,

> It helped teachers to see the need for the district and campuses to have common expectations. They had opportunities to meet together to talk about exactly what should be taught, to talk about instructional strategies. It has brought the Algebra I teachers together. They now have common work.

Every lead Algebra I teacher and principal agreed that their participation in concurrent professional development played a role in building assent on these matters and that the common lessons and assessment tasks were vital in doing so.

Lead Algebra I teachers pointed to the collaboratively produced common lessons and assessments as a way to conceptualize and make concrete their department's newly emerging collective understanding. The lead Algebra I teachers repeatedly talked about the importance of participating as a department, forcing discussions about curriculum and instruction and, as a department, coming to some agreement on the Algebra I program. One teacher noted,

> We were able to discuss ideas rather than compete with each other. The conversations let us talk and compare and make decisions together. It was good to do this as a department. It has forced us to talk to each other about what works. We're all in sync with other teachers on our campus and other campuses.

The establishment and transmission of the common norms were accomplished through team dialogue focused on the common lessons and assessment tasks.

Theme One Summary

Each of the three concurrent professional development components played a relatively equal role in the development of a common understanding and shared vision. Participants indicated that collaboratively analyzing student achievement data and using comparison data afforded them a new perspective. This in turn created the impetus for change. The perceptual data generated in the Gap Analysis process surfaced "the realities" of their Algebra I programs and generated the notion that a more common approach to the teaching and learning of Algebra I may benefit

students, teachers, and administrators. The Common Lessons and Assessment Tasks were perceived as a way to establish this more common, non-negotiable approach to Algebra I.

Theme Two: Emergence of Instructional Program Coherence

The collaborative learning discussed in the previous section on Theme One assumes a shared focus, shared responsibility, and a disciplined approach to achieving the goal. These ideas are also at the heart of Theme Two—instructional program coherence. Researchers (Bryk, Newman, Smith, & Allensworth, 2001) define instructional program coherence as a set of interrelated programs that are guided by a common framework for curriculum, instruction, and assessment and are pursued over time. Bryk et al. (2001) offer a framework for instructional program coherence that includes the presence of the following indicators: (1) a common instructional framework guiding curriculum, teaching, and assessment, and (2) staff working conditions supporting implementation of the framework.

Although this study did not seek to test the Bryk et al. (2001) instructional program coherence framework, these findings are supported by that research. Bryk et al. (2001) indicate that the instructional framework combines specific expectations for student learning, with specific strategies and materials to guide teaching and assessment. This includes the expectation that all teachers within a grade or course purposefully link the curriculum to stated learning goals and structures, and requires all teachers within a grade or course to use common instructional materials and common assessment strategies. In addition, they assert that instructional program

coherence requires staff working conditions that support the implementation of the common instructional framework. They define these staff working conditions to include the following: (1) administrators and teachers expect one another to implement the framework, (2) teachers are held accountable for the effective use of the common instructional framework, and (3) professional development is focused on the common instructional framework. This study's data is detailed in the following sections and relate the concurrent professional development components to the Bryk et al. (2001) instructional program coherence framework.

Concurrent Professional Development Components 1 and 2: Data Scan and Gap Analysis

Data Scan and Gap Analysis components are combined in this section to accurately represent the descriptive data collected. This combination reflects the participants' perceptions of the interrelatedness of these two components as they correlate to the development of a common instructional framework.

It is important to note that, unlike in Theme One, where each identified concurrent professional development component played a relatively equal role, this was not the case in the development of Theme Two, instructional program coherence. Neither the Data Scan nor the Gap Analysis components were recognized by principals or teachers as being as noteworthy as the Common Lessons and Assessment Tasks component in the development of instructional program coherence. This is not to say that the Data Scan and Gap Analysis components were unimportant; they simply played a different role.

In the previously presented data, principals reported being most concerned by the variance in student achievement data when viewed at the teacher level, especially as it relates to course passing rates. One principal reported,

> It was enlightening. We realized that we [administrators] were not doing what we needed to in order to improve. The data showed us the differences in passing TAKS and passing the course. We have very high Algebra I failure rates in some classes and low in others, high at some campuses and low at some campuses, and most did not match their TAKS scores.

As noted earlier in this chapter, the Data Scan component made the data public and highlighted the variance in student achievement. This in turn generated discussion and allowed participants to come to a shared understanding of the data and related issues. A participant commented, "It opened our eyes. We thought we were hitting the target and we're far from it. It's not just one thing, it's quite a few things." Most principals and lead Algebra I teachers agreed that the co-generation of knowledge of the current state and its related data were a significant impetus for change.

The Data Scan and Gap Analysis components were cited consistently as providing participants with recognition of the lack of cohesion and consistency in their Algebra I program. Participants perceived the Gap Analysis process, in particular, as critical in revealing this lack of program cohesion and consistency. Both groups concurred that the data examination in the Data Scan and Gap Analysis components illuminated their incoherent, inconsistent programs; as a result, they felt compelled to take action.

The Data Scan and Gap Analysis components were viewed by both principals and lead Algebra I teachers as the starting point for raising awareness of the need to attain program coherence. The Data Scan and Gap Analysis components were viewed, then, as the tools with which to build widespread support for striving toward a more

cohesive Algebra I program. Furthermore, participants identified the Gap Analysis process as supportive in determining concrete goals and expressing uniform expectations for staff. One principal noted,

> The process really gave us a chance to see where we are. It forced us to look at ourselves. It helped us acknowledge that we need to do things differently. We realized that everyone was doing their own thing and that if we wanted to meet our goals, we'd have to have more consistency. We'd have to expect everyone to follow the curriculum and . . . we'd have to monitor that.

Participants viewed setting goals and clarifying expectations as important first steps in moving toward a common instructional framework to guide curriculum, instruction, and assessment on their campuses and in their districts.

Concurrent Professional Development Component 3: Common Lessons and Assessment Tasks

As established previously, principals and lead Algebra I teachers universally reported that their joint participation in the concurrent professional development sessions provided a forum for consensus on the need for a common instructional framework. One lead Algebra I teacher stated, "We formed a general consensus for the direction we were headed. We would have to implement a non-negotiable curriculum. All of us teaching Algebra I would have to. We had to have more consistency." Lead Algebra I teachers and principals universally reported that the common lessons and assessment tasks served as common instructional guides for Algebra I teachers within their department. Participants reported intensive and sometimes tough dialogue and deliberation in reaching consensus. One teacher said,

> It was very hard—coming to agreement. But it was important. It said "This is what we expect all teachers to do and all students in the district to experience in Algebra I." There were all those conversations that went on in terms of what we thought was important for the Algebra I classrooms. A lot of good came out of those conversations. We're more focused and we have more consistency.

It was through the dialogue and deliberation that principals and teachers came to agreement on matters of curriculum, instruction, and assessment. They indicated that the collaborative process of developing common lessons and assessments served the purpose of establishing and coordinating common curriculum and assessment among the Algebra I teachers on their campus; the collaborative construction of the common lessons and assessment tasks served as the cornerstone for the initial development of a common instructional framework.

The concurrent professional development provided an opportunity for high school principals and lead Algebra I teachers to co-construct a common understanding of the non-negotiables related to the Algebra I curriculum. Lead Algebra I teachers perceived the development of a non-negotiable curriculum (i.e., common lessons and assessment tasks) as way to conceptualize and make concrete their shared understanding of the Algebra I curriculum. One teacher said,

> The common lessons have helped us as a department to understand the TEKS more. They're written in a way where they seem pretty general. So we have done a lot to try to make sure that everyone understands what each of the TEKS means.

Another teacher noted,

> It was important to have all the Algebra I teachers working together as a group. We decided where we want to be and how we're going to get there. We got to the specifics of Algebra I. We discussed the teaching methods and materials that we would all use. It makes us more consistent, which is good for the kids and us.

Concurrent professional development provided a forum for the development of a common understanding of the standards among participants. Principals and lead Algebra I teachers regularly noted the meaningfulness of coming together to come to agreement on what and how to teach through the common lessons and assessment tasks.

The collaboratively produced common lessons and assessment tasks were consistently identified as a venue for communicating the expectations of the common instructional framework. One principal said, "The common lessons and scope and sequence helps us say 'I expect us to be doing XXX during this window.' As previously noted, lead Algebra I teachers repeatedly talked about the importance of the entire department conversing about curriculum and instruction frameworks, while principals and lead Algebra I teachers reported requiring all Algebra I teachers in the department to participate in the development and implementation of the common lessons and assessment tasks. One teacher noted, "There was a lot of ownership of the common lessons we developed. We now have common work, a common curriculum." The common lessons and assessment tasks and the dialogue surrounding their development, then, served as the core of the common instructional framework for the Algebra I teachers in the department.

The data provided by the lead Algebra I teachers indicated that prior to the development of the common lessons, Algebra I teachers were all in different places, doing different things. Despite the long-held tradition of teacher autonomy and decision making regarding what to teach, when, and how, lead Algebra I teachers recognized the benefits to student achievement (as well as to themselves) in coming to agreement on a common scope and sequence. Scope and sequence development, then,

was a by-product of the common lessons and assessment tasks. One lead Algebra I teacher responded, "We were finally able to come to agreement in terms of sequences of topics. That was very tough, very difficult. Some teachers had to drop things they always teach and some had to start teaching the topics they haven't done before." The common scope and sequence served to further coordinate curriculum and instructional strategies within the Algebra I course and to strengthen the coherence of the instructional program.

One teacher described this "by-product" as "monumental," in that, throughout the district's existence, they had never had a scope and sequence at the district or campus level. One lead Algebra I teacher said,

> Although not everyone was happy, it allowed us to have conversations about curriculum and instructional issues. It allowed us to question our individual curriculum and why we all were teaching different things in Algebra I. It helped us establish a common core.

This set the stage for and fostered a commitment to common standards for curriculum and instruction.

The impact of the common lessons and assessment tasks, and the development of the common scope and sequence, extends beyond the production of the documents themselves. In many cases this marked the first time that principals were involved in the creation of instructional frameworks for Algebra I. As previously noted, the principals were not fully involved in the Algebra I teacher sessions. It was in these sessions that the department Algebra I teachers came together to create the common lessons and assessment tasks. Although principal participation in these sessions primarily consisted of participatory visitations of 1–3 hours, both principals and lead Algebra I teachers viewed the principals' visibility in the sessions as giving authority

to the work. One principal replied, "Although I don't know much about Algebra I my presence in the Algebra I sessions said 'this work is important.' It also helped me know what to expect to see in the classrooms in the coming weeks." While the principals acknowledged that they lacked the content knowledge necessary to contribute in significant ways regarding the mathematics, they recognized the need for consistency and perceived their support of the common instructional framework as necessary. Only one principal held that mathematics activities and the development of mathematics frameworks was the domain of the teachers and that her involvement was unnecessary and "a waste of time."

Principals also perceived the common lessons and scope and sequence as a way to promote the notion of a non-negotiable curriculum. While teachers, too, had this perception, they indicated that the common lessons and scope and sequence were a way to build consistency and continuity across their Algebra I classes and promote collegial conversations. They perceived the common lessons and scope and sequence as a way to keep track of each other while "building unity and consistency." Teachers reported being pleased that they had "collaboratively developed something concrete that they can actually use. We've all agreed that we're going to use them [common lessons and scope and sequence]."

Principals, on the other hand, viewed the common lessons and scope and sequence as a tool for monitoring whether or not the common instructional framework was being implemented by the Algebra I teachers. For example, one principal said, "The common lessons and scope and sequence create a little pressure on the teachers. But they help me know which teachers are on target and what they're supposed to be doing. I know who is and who isn't following the agreed-upon timeline." More often

than not, principals recognized these tools as invaluable resources for themselves as well as the Algebra I teachers.

Although there was some initial resistance among certain participants to the establishment of a common instructional framework (common lessons, assessment tasks, and scope and sequence), it was reported that most teachers eventually "came around." The process of establishing a common instructional framework, then, allowed teachers and principals to have conversations with one another on matters of curriculum, instruction, and assessment. Teachers frequently stated that they now can "talk about what works and what doesn't." Regarding assessment in particular, one teacher stated, "The lessons and assessments have made us more responsible for assessing what students really understand. We now can talk about what a 'good' paper looks like and what makes for good student responses." The common instructional framework set the stage for the development of a shared culture regarding the teaching and learning of Algebra I.

In all cases, the principals and lead Algebra I teachers agreed that their involvement in concurrent professional development activities promoted the internal development of a common instructional framework. One principal noted, "This [the concurrent professional development] has brought together and caused administrators and teachers to get deeply involved with the curriculum work." The emergence of a common instructional framework was viewed as being a significant accomplishment for both teachers and principals. For both principals and teachers it provided internal support and direction for their daily work and a sense of mutual accomplishment, stemming primarily from the production of common lessons and scope and sequence. Principals viewed the common instructional framework as a tool for monitoring

teacher implementation of the curriculum, whereas lead Algebra I teachers viewed the instructional framework as a way to promote collaborative exchange within their department, and in some instances, across the district. Lead teachers viewed the emergence of a common instructional framework as a way for them to engage in frequent, continuous, and increasingly concrete talk about their teaching. Regardless of the different ways in which principals and lead Algebra I teachers viewed the usefulness of the common instructional framework, the framework itself served to support their conviction that a more common approach to instruction would assist student achievement.

Concurrent Professional Development Component 3: Common Lessons and Assessment Tasks

Staff working conditions conducive to instructional program coherence include the expectation that the common instructional framework be implemented. Lead Algebra I teachers and principals in this study consistently reported an expectation that the common instructional framework (in the form of common lessons, assessment tasks, and the scope and sequence) be implemented by all Algebra I teachers in the department. That expectation was communicated through interactions between the principal and lead Algebra I teacher and co-delivered to the Algebra I teachers in the department via verbal communication in departmental and individual meetings as necessary.

Lead Algebra I teachers reported monitoring their Algebra I colleagues through the implementation of the common assessment tasks. For example, one

teacher reported, “We [department Algebra I teachers] try to keep track of where everyone is in the timeline. We make sure everyone is following the common lessons and timeline. We want to make sure that the curriculum is delivered in coordination.” Lead Algebra I teachers reported keeping track of who was following the common instructional framework and making sure that everyone was following it. One principal reported, “My department chair, too, is monitoring the lessons and helping everyone to implement them.” Those not implementing the common framework received a moderate amount of pressure from their colleagues and administrators.

Algebra I teachers were held responsible for bringing back evidence of student learning to the professional development sessions, and regularly engaged in conversations with other teachers about the effectiveness of the activities within the established common instructional framework. Lead Algebra I teachers frequently referred to being responsible and accountable to each other as teachers, and this was usually mentioned in a positive tone. Teachers reported that through the implementation of a common instructional framework, they were able to have conversations about what worked, what did not, and how to refine their lessons.

One lead Algebra I teacher acknowledged,

> We were held responsible for bringing back evidence of student learning and we discussed what happened in the activities, what was good, what was bad, and what could we have done better. We learned from each other. But having to be responsible and doing it [the common lessons and assessments] during the year was good.

Teachers frequently reported learning from each other. “Learning from each other is one of the most important parts because it’ll last longer,” one teacher said. Lead Algebra I teachers and principals reported that their Algebra I teachers were

collaborating more frequently—as another teacher said, "We all follow the same lesson plans. I'm trying things which I have not before and we all have built a sense of confidence." This was attributed in part to the reduction of the variation in what and how Algebra I lessons were being delivered. Teachers met regularly to describe their strategies, share ideas, and discuss what was working.

Administrators, too, benefited from the explicitness of the framework and expected its implementation. From the administrator's vantage point, the common instructional framework produced concrete tools that allowed them to do something they had never done—monitor implementation of the curriculum. One principal said, "I need to be visible in the classroom. By being visible in the classroom, the teaching that we're expecting will take place. We'll know whether or not it's taking place." These tools became a measurable set of goals for the collective achievement of teachers, as well as something that principals could expect to see classes working toward across the department. They reported developing a better understanding of the role of monitoring and recognized that the visible attention influenced the Algebra I teachers.

Teachers were not only accountable to administrative leadership for their actions; they became accountable to their colleagues and were subject to group sanctions if they deviated from the collective expectations. Teachers reported a moderate amount of anxiety in that they now could look at each others work and determine whether or not the common instructional framework was being implemented. This represented a departure from autonomy and anonymity to accountability. This shift from individual to collective accountability is illustrated in

several studies of collaboration and is identified by Bryk et al. (2001) as a major condition for program coherence.

The importance of collective participation of all departmental Algebra I teachers in the Algebra I Teacher Team (ATT) professional development activities was repeatedly cited as being a critical support for the development and implementation of the common lessons and assessment tasks. One teacher said, "Having done this [develop the common lessons and assessments] was critical. It has forced us to talk as a department and to say as a department "we're going to do this." It's great because everyone is going in the same direction." The professional development activities were viewed as providing much-needed support for the implementation of the common lessons and assessment tasks. Lead Algebra I teachers reported that collective participation in professional development connected the work of Algebra I teachers to the common instructional framework and provided support for their teachers. Holcombe (2002) and Porter (2001) support this notion of collective participation and found that collective participation is related to instructional program coherence.

Principals in particular viewed this as an opportunity to provide support for teachers in implementing the common instructional framework. Most frequently mentioned was the usefulness of the concurrent professional development in developing coherence and continuity. One principal stated,

> They [Algebra I teachers know where they're headed, they're all going in the same direction, and doing specific units at specific times. They're all getting training that goes with it. They work on making sure that everyone knows exactly what they're supposed to be doing.

Theme Two Summary

The common lessons and assessment tasks functioned as a common instructional framework, a key element of instructional program coherence. Additionally, this study's data indicted the participants perceived the presence of the working conditions supportive in implementing the common instructional framework. Participants identified supportive working conditions that include (1) collective teacher participation, (2) teacher and administrative expectation for framework implementation, and (3) accountability for use of the framework.

Research Question Two Summary

Analysis of data related to Research Question Two, the ways in which the concurrent professional development components were perceived to be significant, surfaced two recurring themes: (1) development of common understanding and shared vision, and (2) emergence of instructional program coherence.

Participants reported that the concurrent professional development component involving the presentation of district and campus student achievement data supported the development of a common understanding of the strengths, weaknesses, and gaps in their Algebra I instructional program. The knowledge and information from the analysis created a widespread awareness of the need to modify their current curriculum, instruction, and assessment practices. This, in turn, led to the development of a shared vision of the Algebra I instructional program. Lead Algebra I teachers and principals agreed that their participation in concurrent professional

development played a role in eventual agreement on these standards and expectations and in forging widespread, collective understanding of the realities of their Algebra I program.

The common lessons and assessment tasks functioned as what Bryk et al. (2001) refer to as a common instructional framework, a critical element of instructional program coherence. The common lessons, assessment tasks, and scope and sequence served to coordinate curriculum, instruction, and assessment practices among Algebra I teachers on the campuses. The importance of collective participation of all departmental Algebra I teachers in the Algebra I Teacher Team professional development activities was repeatedly cited as being a critical support for the development and implementation of the common lessons and assessment tasks. It follows, then, that collective participation is a critical component related to instructional program coherence. Collective participation played a role in a shift from individual to collective accountability by both groups in this study. Principals and lead Algebra I teachers perceived the concurrent professional development as a way to promote a common instructional framework and support staff working conditions to support and advance implementation of the framework. The data indicted the presence of the following supportive working conditions: (1) collective teacher participation, (2) teacher and administrative expectation for framework implementation, and (3) accountability for effective use of the framework. Participants viewed the common framework and supportive working conditions as key factors to assist them in achieving the shared Algebra I program vision and goals.

CHAPTER 5: Conclusions and Implications

Chapter One of this document describes the objectives and motivation for this study. Chapter Two provides readers with information about Algebra I mandates, instructional leadership, principal training/professional development, and teacher professional development. The strategies used to collect and analyze the data in this study are described in Chapter Three. The results of the analyses are in Chapter Four.

The purpose of this chapter is to provide the reader with an interpretation of the results of this study. Chapter Five is divided into five sections. The first section is a review of the purpose of the study. The second section reviews the study's findings. The third section contains a discussion of the limitations of the study's findings. The fourth section is a discussion of the conclusions and implications for the field. The final section contains a discussion of implications for future research.

PURPOSE OF THE STUDY

Rising expectations, the mathematics standards movement, and state and federal assessments and accountability systems have established new measures by which schools are held accountable. Awareness is growing among policy and decision makers that administrators and teachers require richer, more focused opportunities to learn, particularly in the context of new standards and high stakes accountability.

There exists extensive research and literature indicating that the professional development of teachers is a key ingredient in improving our schools. Similarly,

much has been written suggesting that transforming principals into instructional leaders via professional development is an essential element of school improvement efforts. Typically, however, principal and teacher professional development activities have been conducted independently of one another. Frequently this results in a fragmented approach to school improvement.

Because conventional approaches to in-service are typically targeted at either teacher or principal audiences and are widely decried as inadequate, there is value in examining the potential of concurrent principal and teacher professional development. The purpose of this study is to examine the perceptions of high school principals and lead Algebra I teachers to determine which aspects of concurrent teacher and principal professional development they perceive as critical to their work. To that end, this research study was guided by the following two research questions:

(1) What components of concurrent professional development do teachers and principals perceive as important to them in improving Algebra I curriculum, instruction, and assessment?

(2) In what ways are these perceived components important?

REVIEW OF THE FINDINGS

Research Question One attempted to ascertain which concurrent professional development components high school principals and lead Algebra I teachers perceived to be most important to them in matters of curriculum, instruction, and assessment.

Their responses consistently pointed to three components: (1) Data Scan, a presentation of the student achievement data, (2) Gap Analysis, a self-assessment process, and (3) the development of Common Lessons and Assessment Tasks.

Research Question Two explored the participants' perceptions of the significance of the three identified professional development components. The exploration of Research Question Two produced two themes: (1) the development of a common understanding and shared vision and (2) the emergence of instructional program coherence.

Theme One, the development of a common understanding and shared vision, was in part, perceived to be created through the presentation of student achievement data and the Gap Analysis process. Participants frequently cited the use of data as supporting the development of a common understanding of the strengths, weaknesses, and gaps in the Algebra I instructional program. The knowledge and information from the analysis of their data created widespread awareness of the need to adjust their current curriculum and instruction practices. Participants acknowledged the role concurrent professional development played in assisting them in coming to agreement on a direction for their Algebra I programs and expectations for teacher and leader behaviors.

Theme Two, the emergence of instructional program coherence, transpired primarily from the development of the common lessons and assessment tasks. The common lessons and assessment tasks provided the basis for the development of a common instructional framework for Algebra I—a critical component in instructional program coherence. Additionally, the common lessons and assessment tasks provided supportive working conditions, assisting teachers in implementing the common

instructional framework. The data indicated the presence of the following supportive working conditions: (1) collective teacher participation, (2) teacher and administrative expectation for framework implementation, and (3) accountability for effective use of the framework. Participants viewed the common framework and supportive working conditions as key factors to assist them in achieving the shared Algebra I program vision and goals.

LIMITATIONS OF THE FINDINGS

As previously noted, limitations of this study include:

small sample size

highly contextual professional development setting

Furthermore, this study is situated in a high-stakes accountability environment containing significant sanctions for poor student performance. The pressure to achieve in high-stakes environments may compel educators to act in ways—both positive and negative—they may not otherwise. As noted in various studies on the implementation of improvement efforts, participant rhetoric is high in early stages of implementation. In a study of a large-scale district-level K-8 mathematics improvement effort, Batchelder (1999) found that actual changes in practice come later and lag behind the use of rhetoric. That may be indicative of this study as well, because this study analyzed participant perceptions rather than actual practices and was conducted during the first year of the improvement effort. Studies of this nature depend on accurate, dependable participant responses. It is difficult to guard against participant over-reporting or inaccurate reporting. Although triangulation of data did not reveal discrepancies between the campus principal and their lead Algebra I teacher

reports, it is possible that both sets of participants reported what they thought the interviewer wished to hear rather than reporting what was actually occurring.

CONCLUSIONS AND IMPLICATIONS FOR THE FIELD

This study was designed to examine components of concurrent professional development and the significance of those components. The results of this study indicate that participants perceived there to be value in the components of concurrent professional development that unified instructional leadership tasks and instructional program coherence indicators. Participant perceptions reveal that (1) instructional leadership exists as a shared function, (2) instructional leadership emanated from the tools produced within the concurrent professional development, and (3) shared instructional leadership created the emergence of Algebra I program coherence. The perceived shared enactment of instructional leadership tasks promoted the necessary conditions for the emergence of instructional program coherence. The perceived instructional leadership behaviors cultivated by those shared leadership tasks further assisted the participants in their efforts to attain instructional program coherence.

Participants perceived the concurrent professional development as useful in assisting principals, in conjunction with lead Algebra I teachers, to perform key instructional leadership tasks, such as (1) providing vision and direction for the Algebra I program; (2) setting a constructive tone and high expectations; (3) working to ensure a common curriculum framework; (4) establishing clear expectations for implementation of the common curriculum framework; and (5) monitoring and holding staff accountable for the effective implementation of the common curriculum

framework. Participant perceptions indicated that concurrent professional development components provided specific and concrete opportunities for principals and lead teachers to enact key instructional leadership actions while simultaneously promoting instructional program coherence.

Participants' perceptions indicated they shared responsibility for carrying out instructional leadership tasks. Lead teachers, however, played a key role in building grassroots support and advocacy for instructional leadership tasks considered less tangible and concrete such as (1) providing vision and direction for the Algebra I program, and (2) setting a constructive tone and high expectations. These particular instructional leadership tasks appeared to benefit from a broad base of support in which other staff members shared in both the development and communication. The involvement of lead teachers in these components was perceived to be as important as the principals' involvement.

Professional development that considers the development of tools for principals and teachers together enhances the likelihood that leaders will carry out key instructional leadership actions. In the case of this study, the curriculum and instruction tools (i.e., common lessons, assessment tasks, and scope and sequence) were developed within the concurrent professional development sessions. The use of the curriculum and instruction tools was perceived to produce clarity, mutual accountability, and responsibility. Participants perceived the tools as tangible support structures for both the implementation and monitoring of program improvements. The development of useful curriculum and instruction tools appeared critical to the instructional leadership role. Concurrent professional development that provides support and produces useful tools for both teachers and principals was perceived as

producing behaviors congruent with instructional leadership behaviors and as supporting instructional program coherence.

It is well documented that most principals lack the knowledge necessary to carry out important curriculum and instruction tasks in the area of mathematics. This study demonstrated, at least in the initial stages, that the explicitness of an instructional framework, the development of a few useful monitoring tools, and regular involvement of content experts could overcome the lack of principals' content knowledge. Concurrent professional development that supports the production of an instructional framework and monitoring tools for principals may prove useful in encouraging high school principals to act as instructional leaders, despite their discomfort with and limited knowledge of mathematics.

Policymakers, researchers, and practioners have argued for teacher professional development. The argument is this: what teachers know and do impacts what their students know and do. Deeper content knowledge, more content-specific instructional strategies, and greater understanding about how students learn better enable teachers to design instruction to meet the varying needs of students. The results of this study indicate that in addition to paying attention to building teachers' content and pedagogical skills, professional development that considers the development of instructional leadership skills and program cohesion may have benefits.

Instructional leadership remains a dominant theme in today's educational leadership circles. A commonly held belief is that principals are key in the successful implementation of reform efforts and that they should act as instructional leaders. Findings from this study suggest that, at least at the high school level, shared

instructional leadership can have a powerful impact on the emergence of instructional program coherence. Professional development for leaders may be enhanced by considering opportunities for the following: (1) distribution of responsibility for providing vision and direction for the Algebra I program, (2) ensuring the development of a common curriculum framework, (3) establishing clear expectations for implementation of the common curriculum framework; and (4) monitoring and holding staff accountable for the effective implementation of the common curriculum framework.

IMPLICATIONS FOR FUTURE RESEARCH

The reform of mathematics education rests firmly on a commitment to change the form of teaching and learning in our schools. To this end, policymakers and practioners have looked for ways to improve classroom teachers' and campus leaders' knowledge and skills. In order to accomplish this, significant professional development programs have been implemented. These professional development programs have largely ignored the symbiotic relationship of teachers and principals in school improvement efforts. This study provides new insights to help guide and inform the design of teacher and leader professional development.

The results of this study are based upon a sampling of schools involved in the Partnership for High Achievement Algebra I initiative. The schools in the sample were determined to have joint involvement of the high school principal and lead Algebra I teacher in the Partnership for High Achievement professional development activities. There is a need to determine the extent to which these findings generalize

to the larger population of schools that had also had joint involvement of principals and lead Algebra I teachers.

Additionally, there exists a second set of schools involved in the Partnership for High Achievement Algebra I initiative. In these schools, due to a variety of local reasons, the high school principal and lead Algebra I teacher are not involved in the concurrent professional development activities. A study of these districts is warranted to determine whether differences exist between schools with joint involvement of principals and teachers and those without.

Further study of the interactions between instructional leadership and instructional coherence are warranted. Unanswered questions include

(1) Is instructional leadership a necessary condition for instructional program coherence?

(2) What are the necessary and sufficient conditions for Algebra I instructional program coherence?

(3) What are the necessary components of professional development programs that promote mathematics instructional program coherence?

(4) Do the necessary components vary from content to content? And

(5) To what extent is the participation of principals and teachers necessary to achieve program coherence?

Although this study did not explore teacher content knowledge, the need to increase teachers' content knowledge is well documented and well researched. However, virtually untouched is research on the effect of principals' mathematics

content knowledge, or lack thereof, on student achievement, enactment of instructional leadership in mathematics, and instructional program cohesion.

Determining the impact of professional development on participating teachers and on their students is a difficult task, but it is one that must be undertaken. The effectiveness of professional development should ultimately be measured by the impact that it has on students' learning. However, plenty of literature and research on professional development exists that does not use student achievement as a measure of effectiveness. This is one such study. Continued research on concurrent professional development and its effects on student achievement is called for and would add to the body of research.

CONCLUDING REMARKS

Considerable time, energy, and financial resources are currently being expended on professional development efforts. These professional development efforts cannot be a collection of sporadic and disjointed endeavors. Rather, the programs must involve coordinated work that is inclusive, broad-based, and grounded in the day-to-day realities of school life. Administrators and teachers must jointly carry out the work in order to deal with the problems of curriculum and instruction and bring about instructional coherence. We must continually document and evaluate the efforts of principals and teachers so that we more fully understand the programs that make a difference in the lives of educators and students.

APPENDIX A: Interview Guides

Principal Interview Protocol

1. Tell me a little about your leadership experiences and background. Please include your teaching background/certification areas.

2. What do you perceive to be a principal's greatest challenges in improving student achievement in Algebra I? (probe for 2-3) (steer away from "attendance, motivation, freshman, irresponsibility) What has caused you to identify these as challenges?

3. Tell me about 2 or 3 strategies you are using to improve student performance in Algebra I. What are you hoping to accomplish with these strategies?

4. What is your role as principal in these improvement efforts? Provide some specific examples for each of the strategies mentioned.

5. Describe a quality Algebra I lesson. What do you want to see students doing? What do you want to see happening? Why do you want to see these things happening? (probe for 2-3 examples) What has influenced this view of the Algebra I classroom? (probe for 2-3 examples, probe for whether or not the PHA work has influenced this perception and how)

6. When you think about what you see going on in your Algebra I classrooms, what is one area of Algebra I instruction you'd like to see improved? Why would you like to see it improved? What are 2 or 3 things that you're doing to address this?

7. In the last 12 months, how often have you participated in professional development with your Algebra I teachers? What was the nature of this professional development? (probe for content, purpose). What were the outcomes (what did they learn, what did it change). How would you describe the overall value and impact on your work?

8. What resources have been most helpful to you in improving your ability to increase student achievement in Algebra I? How have these resources been of use to you as an instructional leader? (probe for specifics of PHA, professional development, technical assistance, curriculum staff, professional readings, district structures, policies, practices, etc.)

9. What do you consider to be the 2 or 3 most important aspects of the Partnership for High Achievement work and why? Please be as specific as possible. (probe for specificity.)

10. Which sessions/components of the Partnership for High Achievement have had the most impact on you? Talk with me about some examples from the teacher sessions as well as the leadership sessions. (probe for the following: current state data and goal setting, use of research articles, PTM process, developing district structures, model lesson—pool or painted towers). How have they impacted your views on the teaching and learning of Algebra? Your Algebra I teachers? What actions have been taken as a result?

11. Tell me what you think about the involvement of your lead Algebra I teacher/department chair on the Partnership for High Achievement Leadership Team. From your perspective, what have been the advantages or benefits for you? (probe for 2-3 advantages/benefits) For the teacher leader/department chair? For your Algebra I program?

12. What were the two most important learnings resulting from the Partnership for High Achievement work this year?

13. From your perspective, what have been some of the most significant actions that have you have taken to support and strengthen your Algebra I program this year?
    What prompted you to take those actions? What makes these actions significant?

14. Tell me a success story related to your Algebra I work this year related to the professional development through the Partnership for High Achievement.

15. Is there anything else you'd like me to know about your work and the Partnership for High Achievement?

Thank you for taking the time to respond to these questions.

Teacher Interview Protocol

1. Tell me about teaching experiences, how you came to work at this school, how long you have been working at this school and in the district.

2. Tell me about the strategies you are using to improve student performance in Algebra I this year. What are you hoping to accomplish with these strategies?

3. What is your role in these improvement efforts? Your principal's?

4. Describe a quality Algebra I lesson. What do you want to see happening? What has influenced this view of the Algebra I classroom? (probe for whether or not the PHA work has influenced this perception and how)

5. What is one area of Algebra I instruction that you'd like to see improved? Why would you like to see it improved? What are 2 or 3 things that are being done to address this?

6. What resources have been most helpful to you in improving your ability to increase student achievement? How have these resources been useful to you? (probe for PHA leadership and PTM connections, other professional development, technical assistance, district structures, etc)

7. Which sessions/components of the Partnership for High Achievement have had the most impact on your and your colleagues? Talk with me about some examples from the teacher sessions as well as the leadership sessions. (probe for the following: current state data and goal setting, use of research articles, PTM process, developing district structures, model lesson—pool or painted towers)

8. How have they impacted you? Your colleagues? Your principal? What actions have been taken as a result?

9. Tell me what you think about involving lead teachers/department chairs along with principals and district leaders on the Partnership for High Achievement Leadership Team. From your perspective, what have been the advantages or benefits for you? (probe for 2 or 3) Your principal? Your campus? Your Algebra I program?

10. What were the two most important learnings resulting from the Partnership for High Achievement work this year?

11. Tell me a success story related to the Partnership for High Achievement Algebra I work this year.

12. What effect has the Partnership for High Achievement had on you, your teachers, your principal/leadership team? How does that (the effect) relate to improving student achievement?

13. What do you perceive to be your greatest challenges in improving student achievement in Algebra I? (probe for 2-3) (steer away from "attendance, motivation, freshman, irresponsibility, and other student factors) What has caused you to identify these as challenges?

14. Is there anything else you'd like me to know about your work and the Partnership for High Achievement?

Thank you for taking the time to respond to these questions.

APPENDIX B: Common Lesson and Assessment Task Planning Model

Professional Teaching Model

The Process

Study of the TEKS

- Select a cluster of TEKS from the District curriculum
- Develop a common understanding of the
  - content and processes called for in the TEKS
  - breadth and depth of the TEKS
  - programmatic nature of the TEKS
  - TEKS/TAKS connection

Determine the criteria and assessment task

- Select or develop a quality common assessment task that aligns with the selected TEKS
- Develop common assessment criteria aligned with the TEKS
- Develop a set of common standards for student work
- Set a measurable goal for the level of student performance

Plan a common assessment task and lessons

- Promote collaboration to identify resources, ideas, and strategies that make individual efforts more productive
- Select or develop common lessons aligned to the assessment task
- Identify and integrate important components of quality lessons
- Examine instructional resources for their strengths, weaknesses, and alignment to the TEKS
- Share a variety of evidence-based instructional strategies

Implement the lessons and assessment task

- Implement common lessons and assessment task
- Reflect upon the effectiveness of the lessons and assessment task

Analyze results and student work

- Analyze student work to determine student understanding of the TEKS.
- Analyze student work to determine the effectiveness of the lesson and to strengthen instruction
- Refine common understanding of the criteria, standards and TEKS to check inter-rater reliability
- Compare student performance to established goal
- Use assessment results to guide improvement in the lessons and program
- Determine "next steps" for students

APPENDIX C: Gap Analysis Questions

Gap Analysis

Partnership for High Achievement

1. **How well does the district ensure that the curricula (the actual curricula taught in the district's classrooms) is aligned with state and local standards in a manner that will lead to the attainment of the district's goals and objectives?**

Indicators of 100%

a) Clearly written curricular documents, based on the TEKS, exist at the district level that identify the specific knowledge and skills students will acquire by grade level and subject area.

b) Campus and central office leaders and teachers know exactly what is to be taught and learned at each grade level and in each subject, and that the district curriculum is non-negotiable.

c) Leaders and teachers are involved in a regularly scheduled, structured, ongoing study of the curricula designed to support collaborative planning and problem solving and to focus on student learning needs.

d) Teachers and leaders regularly monitor instruction to assure alignment of the written and taught curriculum.

Evidence of Current Status

My rating of the current status of our district on this question is:

0–20%	21–50%	51–75%	76–100%
Little or no evidence of indicators.	Activities for some indicators are being implemented but gaps still exist; no systems in place yet.	Activities for indicators are being implemented; systems are in place.	All understand, implement and support the system's plans and actions.

6/03

Gap Analysis

Partnership for High Achievement

2. How well does the district ensure that instruction in all schools and classrooms is effective, aligned with the district's curricula, and likely to lead students to the attainment of the district's goals and objectives?

Indicators of 100%

a) Principals, teacher leaders, and central office staff regularly monitor instruction to ensure that prescribed curricula are being delivered to students in a manner that results in the attainment of the district's goals and objectives.

b) Monitoring includes all teachers who teach the subject no matter what the instructional arrangement, i.e. special education, bilingual education, migrant ed, etc.

c) Monitoring includes strategies such as classroom visits, review of lesson plans, meetings with individual teachers, participation in horizontal and vertical team meetings, district benchmark assessment, etc.

d) Feedback to teachers from this monitoring process is timely and frequent.

e) Teachers are regularly involved in the monitoring through reviews of student work as well as of data from more formal student assessment.

f) Multiple systems are in place to support teachers as soon as problems are identified.

Evidence of Current Status

My rating of the current status of our district on this question is:

0–20%	21–50%	51–75%	76–100%
Little or no evidence of indicators.	Activities for some indicators are being implemented but gaps still exist; no systems in place yet.	Activities for indicators are being implemented; systems are in place.	All understand, implement and support the system's plans and actions.

6/03

Gap Analysis

Partnership for High Achievement

3. How well does the district ensure that assessments at the district, school, and classroom level are aligned with the curriculum, are accurate measures of student performance, and the results are used to guide instruction and improve student achievement?

Indicators of 100%

a) Disaggregated data from state tests are analyzed by district and campus leaders and teachers to determine areas of the curriculum that need attention.

b) Teachers and leaders collaborate to create common assessments as benchmarks of student progress on the district curriculum.

c) Common assessments are given at reasonable intervals throughout the school year.

d) Teachers are trained and supported as they work to develop and use classroom assessments that are aligned with the district curriculum and provide high-quality feedback concerning the effectiveness of instruction.

e) Information from assessment data is readily available in a timely and understandable form for use by teachers and leaders in decision making at all levels of the system (district, school, and classroom).

f) The results of the assessment are regularly discussed with individual teachers and in collaborative teams of teachers and leaders, and success is celebrated.

g) Support in analyzing and using the data is provided on a continuous basis to teachers and leaders.

Evidence of Current Status

My rating of the current status of our district on this question is:

0–20%	21–50%	51–75%	76–100%
Little or no evidence of indicators.	Activities for some indicators are being implemented but gaps still exist; no systems in place yet.	Activities for indicators are being implemented; systems are in place.	All understand, implement and support the system's plans and actions.

6/03

Gap Analysis

Partnership for High Achievement

4. How well does the district ensure that the evidence-based instructional practices are used to engage student learning and meet their diverse student needs?

Indicators of 100%

a) Teachers and leaders regularly engage in professional development activities that focus on evidence-based practices for teaching the district curriculum to a diverse population of students.

b) The professional development includes all teachers who teach the subject no matter what the instructional arrangement, i.e. special education, bilingual education, migrant ed, etc.

c) The investment in professional development is made based on the district and school's academic goals and instructional priorities.

d) Evidence-based practices and arrangements are continually, sought, studied, taught and implemented.

e) Teachers, with support from leaders, regularly collaborate to share successful instructional practices and support each other in implementing new approaches.

f) Multiple systems are in place to support teachers as they work to improve instruction including professional development, collaboration, coaching and modeling, instructional specialists, etc.

Evidence of Current Status

My rating of the current status of our district on this question is:

0–20%	21–50%	51–75%	76–100%
Little or no evidence of indicators.	Activities for some indicators are being implemented but gaps still exist; no systems in place yet.	Activities for indicators are being implemented; systems are in place.	All understand, implement and support the system's plans and actions.

6/03

Gap Analysis

Partnership for High Achievement

5. How well does the district ensure that teachers have and use instructional materials that are aligned with district curricula and focused on the attainment of the districts goals and objectives?

Indicators of 100%

a) Teachers understand that the academic objectives of the district curriculum should guide instruction, not textbooks or programs.

b) Teachers have been given adequate time and support to collaboratively determine how their instructional materials align to the district's curricula and the goals and objectives.

c) Resources and programs are selected and/or developed based on evidence of effectiveness in terms of increased student achievement.

d) As needs are identified for materials to support the teaching of the curriculum, they are made available in a timely manner.

Evidence of Current Status

My rating of the current status of our district on this question is:

0–20%	21–50%	51–75%	76–100%
Little or no evidence of indicators.	Activities for some indicators are being implemented but gaps still exist; no systems in place yet.	Activities for indicators are being implemented; systems are in place.	All understand, implement and support the system's plans and actions.

6/03

APPENDIX D: Gap Analysis Summary

Phase I Summary and Next Steps — XXX ISD

Current State: The district is consistently at or above state average in grades 8 and 9. In grade 10 scores tend to reflect state average and in grade 11 some scores are below state average. Commended performance is below state average in many grades and student subgroups. There is great variation among student subgroups. All student group performance is 67% meeting panel recommendation, 9% commended performance, and approx 75% receiving course credit.

Future State: The goals are to have 95% of all student groups meeting panel recommendation and 45% of all student groups reaching commended performance. Also, to increase the alignment between individual teacher course expectations with that of the state. The benchmarks towards this goal are:

	2005	2006	2007
All students	80%	90%	95%
AA	75%	90%	95%
Hisp	75%	85%	95%
White	81%	90%	95%
Econ	75%	85%	95%

Problem Statement: There is a lack of consistency and monitoring, the non-negotiables are not clear.

Root Cause: There is a lack of comprehensive, consistently implemented systemic structures that ensure student success through the written , tested, and taught curriculum—pieces exist

Ideal State: What does it look like?

- Leaders and teachers are involved in regularly scheduled, structured, ongoing study of the non-negotiable curricula designed to support collaborative planning and problem solving and to focus on student needs.
- Teachers and leaders regularly monitor instruction to assure alignment.
- Monitoring includes strategies such as classroom visits, review of lesson plans, meetings with individual teachers, participation in horizontal and vertical team meetings, district assessment, etc.
- Teachers and leaders collaborate to create common assessments, evaluate student work as benchmarks of student progress on the district curriculum.
- Support in analyzing and using the data is provided on a continuous basis to teachers and leaders.
- Teachers are trained, mentored and supported as they work to develop and use classroom assessments aligned with the district curriculum and provide high quality feedback concerning the effectiveness of instruction.

Dana Center Next Steps

Teachers:

Leaders:

District Next Steps

Review September 15th session with Math Department, in particular geometry teachers

Prepare for September 22nd meeting (Leadership team and selected math and science lead teachers)

Teacher Meetings 8:30 am–4:00pm:
September 22nd, October 13th, November 9th, January 4th, February 8th, March 29th, May 17th
Leadership Team Meetings: Sept 15, Sept 22, Oct 4, Dec 2, Feb 25, May 4

Question 1: How well does the district ensure that curricula (the actual curricula taught in the district's classrooms) is aligned with state and local standards in a manner that will lead to the attainment of the district's goals and objectives?	Question 2: How well does the district ensure that instruction in all schools and classrooms is effective, aligned with the district's curricula, and likely to lead students to the attainment of the district's goals and objectives?	Question 3: How well does the district ensure that assessments at the district, school, and classroom level are aligned with the curriculum, are accurate measures of student performance, and the results are used to guide instruction and improve student achievement?
Ratings: 75 70, 60, 55, 51. 50, 50, 45, 45, 20	Ratings: 50, 40, 40, 35, 30,30, 20, 15	Ratings: 51, 50, 50, 45, 40, 40, 35, 35
Evidence: • unsure about whether or not curriculum documents meet the demands of TAKS • teachers don't use the curriculum documents on a regular bases • some collaborative planning has begun • staff development is connected to higher order thinking skills • not all teachers are monitoring instruction or involved in the work • limited vertical articulation and planning occurs • no regularly scheduled, on-going study of the curriculum • non-negotiables are not clear • teachers are teaming and discussing curriculum • there is no regular monitoring designed to support teachers to improve instruction • curriculum documents are developed at the high school level, not the district level • teachers at the high school are constantly reviewing and monitoring curriculum • leaders and teachers are not regularly monitoring the written, tested, taught curriculum • curriculum is not non-negotiable, teachers do what they like	**Evidence:** • monitoring from central office is not complete—benchmarks only • feedback is timely and frequent but incomplete • multiple systems are not in place to ensure instruction in each classroom is effective • understanding of data by all in the dept—able to identify strengths and weaknesses • delivery of instruction is inconsistent and not sufficient to meet our goals • monitoring is not multi-dimensional • monitoring is irregular and inconsistent • leaders are using benchmark data to monitor • department chair is monitoring individual teachers for consistency in curriculum • we are beginning to monitor for instruction • teachers receive support as necessary • teachers have and use data to monitor • we are data rich—but unsure how its used for instruction • central office staff doesn't regularly monitor instruction—benchmark data is incomplete • there is inconsistent self-monitoring •	**Evidence:** • good use of state data and the development of individual student plans • central office provides data disaggregated for campus and teachers • not sure how to use the data provided • common assessments exist but we lack a process for analyzing data • assessments are not being used to make curriculum and instructional decisions • long range data use is not in place • we analyze data but do not know how to apply • assessments are used as a way to monitor curriculum-but not about delivery • not sure that the rigor of classroom assessments is adequate • not using data to inform or modify instruction • teachers are not adequately trained or supported in writing assessments

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